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PROGRAMMABLE CONTROLLERS

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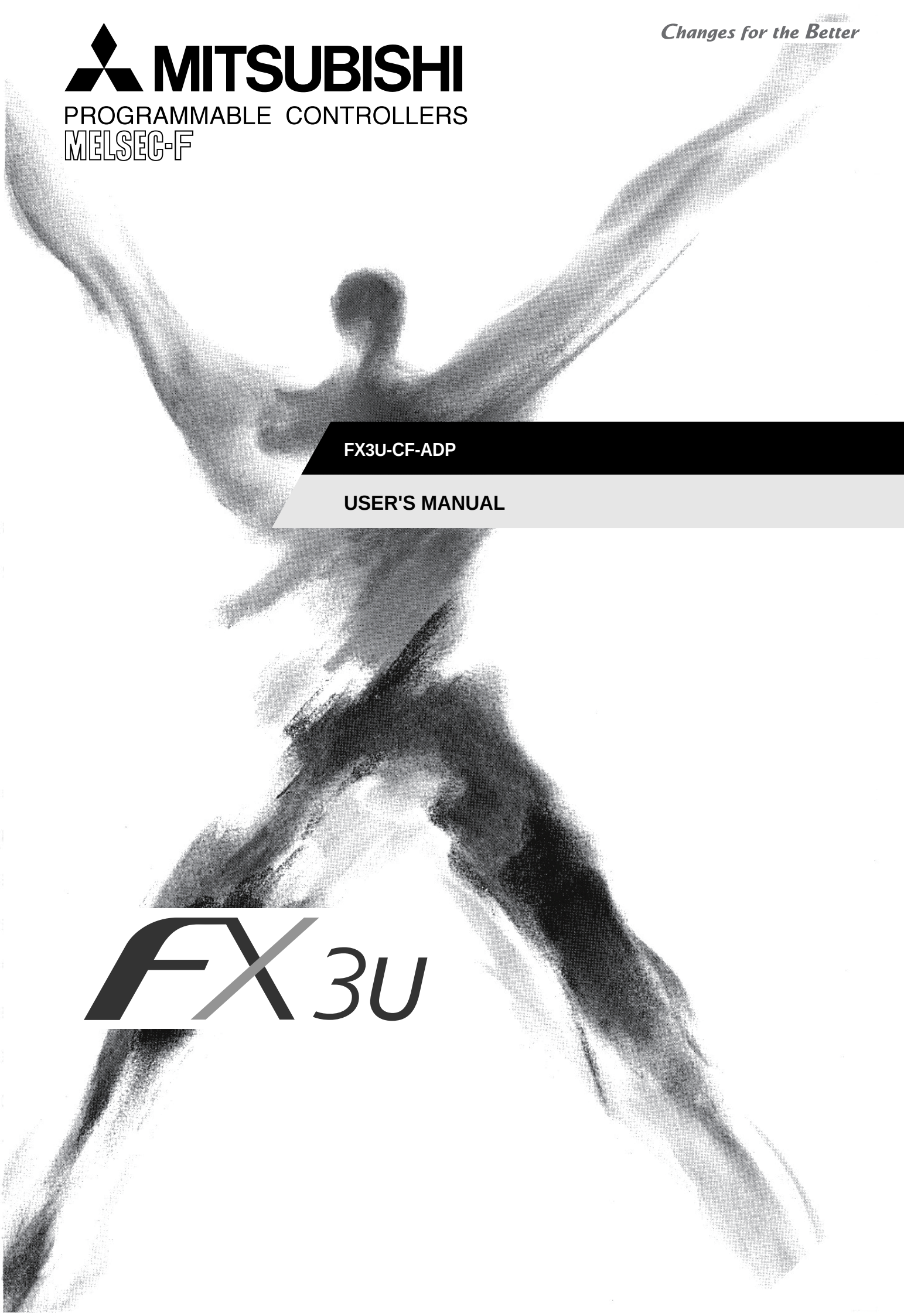

FX3U-CF-ADP

USER'S MANUAL

FX3U

Safety Precautions

(Read these precautions before using.)

Before installation, operation, maintenance or inspection of this product, thoroughly read through and understand this manual and the associated manuals. Also, take care to handle the module properly and safely.

This manual classifies the safety precautions into two categories: DANGER and CAUTION.

DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Depending on the circumstances, procedures indicated by CAUTION may also cause severe injury. In any case, it is important to follow all usage directions. Store this manual in a safe place so that it can be taken out and read whenever necessary. Always forward it to the end user.

1. DESIGN PRECAUTIONS

DANGER	Reference
• Make sure to include the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure. Otherwise, malfunctions may cause serious accidents. 1) Above all, the following components should be included: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits). 2) Note that when the PLC main unit detects an error during self diagnosis, such as a watchdog timer error, all outputs are turned off. Also, when an error that cannot be detected by the PLC main unit occurs in an input/ output control block, output control may be disabled. External circuits and mechanisms should be designed to ensure safe machinery operation in such cases.	15 28

CAUTION	Reference
• Observe the following items. Failure to do so may cause incorrect data-writing through noise to the PLC and result in PLC failure, machine damage or other accident. 1) Do not bundle the control line together with or lay it close to the main circuit or power line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or power line. Noise may cause malfunctions. 2) Ground the shield wire or shield of a shielded cable. Do not use common grounding with heavy electrical systems • During access (ACCESS LED is lit or flickering) to CompactFlash™ card, do not remove the CompactFlash™ card or power off the FX3U-CF-ADP. Failure to do so may cause CompactFlash™ card failures or malfunctions. • If the power is turned OFF while the CompactFlash™ card is being accessed (ACCESS LED is lit or flickering), the buffered data is erased. Also files or CompactFlash™ card itself may be damaged. Do not turn the power OFF while the ACCESS LED is lit or flickering. • Do not apply excessive pressure to the power supply cable or power supply connector. Excessive pressure may cause damage or error.	15 28

2. INSTALLATION PRECAUTIONS

DANGER	Reference
• Make sure to shut down all phases of the power supply externally before installing the FX3U-CF-ADP. Failure to do so may cause electric shock or damage to the product.	22 99

CAUTION	Reference
• Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl2, H2S, SO2, or NO2), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind. If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur. • Do not touch the conductive parts of the product directly. Doing so may cause device failures or malfunctions. • Install the product securely using a DIN rail or mounting screws. • Install the product on a flat surface. If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities. • When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits. Failure to do so may cause fire, equipment failures or malfunctions. • Be sure to remove the dust proof sheet from the PLC's ventilation port when installation work is completed. Failure to do so may cause fire, equipment failures or malfunctions. • Connect the FX3U-CF-ADP securely to special adapter connector. Loose connections may cause malfunctions. • Connect the power connector of the power supply cable securely to the CF-ADP power supply connector. Loose connections may cause malfunctions. • When inserting a CompactFlash™ card into the FX3U-CF-ADP, push it into the CF card slot until the EJECT button pops out. Loose connections may cause malfunctions. • Before inserting/removing a CompactFlash™ card into/from the FX3U-CF-ADP, set the CF card ACCESS switch to OFF and confirm that the BUFFER LED and ACCESS LED are both OFF. Failure to do so may corrupt data within the CompactFlash™ card. • When removing a CompactFlash™ card from the FX3U-CF-ADP, make sure to support the CompactFlash™ card by hand, as it may pop out. Failure to do so may cause the CompactFlash™ card to fall from the FX3U-CF-ADP and break. • Turn off the power to the PLC before attaching or detaching the following devices. Failure to do so may cause device failures or malfunctions. - Peripheral devices, display modules, expansion boards and special adapters - I/O extension units/blocks, FX Series terminal block and the special function units/blocks - Battery and memory cassette	22 99

3. WIRING PRECAUTIONS

DANGER	Reference
• Make sure to cut off all phases of the power supply externally before attempting wiring work. Failure to do so may cause electric shock or damage to the product.	28 99

CAUTION	Reference
• Connect the DC power supply wiring to the dedicated terminal described in this manual. If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out. • Connect the DC power supply wiring to the dedicated connector described in this manual. If an AC power supply is connected to a DC power supply connector, the PLC will burn out. • When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits. Failure to do so may cause fire, equipment failures or malfunctions.	28 99

4. STARTUP AND MAINTENANCE PRECAUTIONS

DANGER	Reference
• Make sure to connect the battery correctly. Do not charge, disassemble, heat, short-circuit, or expose the battery to fire. Doing so may rupture or ignite it. • Do not touch any terminal while the PLC's power is on. Doing so may cause electric shock or malfunctions. • Before modifying or disrupting the program in operation or running the PLC, carefully read through this manual and the associated manuals and ensure the safety of the operation. An operation error may damage the machinery or cause accidents.	28 81 100

CAUTION	Reference
• Do not disassemble or modify the PLC. Doing so may cause fire, equipment failures, or malfunctions. For repair, contact your local Mitsubishi Electric distributor. • Turn off the power to the PLC before attaching or detaching the following devices. Failure to do so may cause device failures or malfunctions. - Peripheral devices, display modules, expansion boards and special adapters - I/O extension units/blocks, FX Series terminal block and the special function units/blocks - Battery and memory cassette	29 81 100

5. DISPOSAL PRECAUTIONS

CAUTION	Reference
• Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.	15

6. TRANSPORTATION PRECAUTIONS

CAUTION	Reference
• The PLC is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications of the PLC main unit manual. Failure to do so may cause failures in the PLC. After transportation, verify the operations of the PLC.	15

FX3U-CF-ADP

User's Manual

Manual number	JY997D35401
Manual revision	A
Date	6/2009

Foreword

This manual describes the FX3U-CF-ADP CF card special adapter and should be read and understood before attempting to install the hardware.
Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

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Outline Precautions

- This manual provides information for the use of the FX3U-CF-ADP CF card special adapter.
  The manual has been written to be used by trained and competent personnel. The definition of such a person or persons is as follows;

1) Any engineer who is responsible for the planning, design and construction of automatic equipment using the product associated with this manual should be of a competent nature, trained and qualified to the local and national standards required to fulfill that role. These engineers should be fully aware of all aspects of safety with aspects regarding to automated equipment.
2) Any commissioning or maintenance engineer must be of a competent nature, trained and qualified to the local and national standards required to fulfill the job. These engineers should also be trained in the use and maintenance of the completed product. This includes being familiar with all associated manuals and documentation for the product. All maintenance should be carried out in accordance with established safety practices.
3) All operators of the completed equipment should be trained to use that product in a safe and coordinated manner in compliance with established safety practices. The operators should also be familiar with documentation that is connected with the actual operation of the completed equipment.

   Note: the term 'completed equipment' refers to a third party constructed device that contains or uses the product associated with this manual.

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions into the system.
- When combining this product with other products, please confirm the standards and codes of regulation to which the user should follow. Moreover, please confirm the compatibility of this product with the system, machines, and apparatuses to be used.
- If there is doubt at any stage during installation of the product, always consult a professional electrical engineer who is qualified and trained in the local and national standards. If there is doubt about the operation or use, please consult the nearest Mitsubishi Electric distributor.
- Since the examples within this manual, technical bulletin, catalog, etc. are used as reference; please use it after confirming the function and safety of the equipment and system. Mitsubishi Electric will not accept responsibility for actual use of the product based on these illustrative examples.
- The content, specification etc. of this manual may be changed for improvement without notice.
- The information in this manual has been carefully checked and is believed to be accurate; however, if you notice any doubtful point, error, etc., please contact the nearest Mitsubishi Electric distributor.

Registration

- CompactFlash is a trademark of SanDisk Corporation in the United States and other countries.
- The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

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Standards

Certification of UL, cUL standards

FX3U-CF-ADP units comply with the UL standards (UL, cUL).

UL, cUL File number :E95239

Regarding the standards that comply with the main unit, please refer to either the FX series product catalog or consult with your nearest Mitsubishi product provider.

Compliance with EC directive (CE Marking)

This document does not guarantee that a mechanical system including this product will comply with the following standards.
Compliance to EMC directive and LVD directive for the entire mechanical module should be checked by the user / manufacturer. For more information please consult with your nearest Mitsubishi product provider.
Regarding the standards that comply with the main unit, please refer to either the FX series product catalog or consult with your nearest Mitsubishi product provider.

Requirement for Compliance with EMC directive

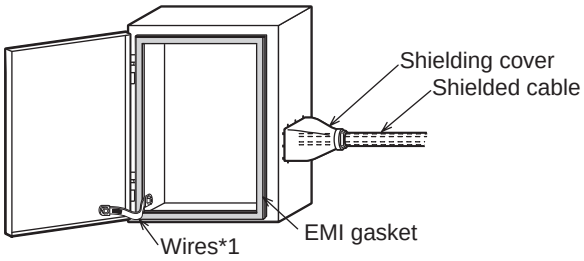
The following products have shown compliance through direct testing (of the identified standards below) and design analysis (through the creation of a technical construction file) to the European Directive for Electromagnetic Compatibility (89/336/EEC) when used as directed by the appropriate documentation.

Type: Programmable Controller (Open Type Equipment)
Models: MELSEC FX3U series manufactured
from June 1st, 2009 FX3U-CF-ADP

Standard	Remark
EN61131-2:2003 Programmable controllers - Equipment requirements and tests	Compliance with all relevant aspects of the standard. EMI • Radiated Emissions • Conducted Emissions EMS • Radiated electromagnetic field • Fast Transient burst • Electrostatic discharge • High-energy surge • Voltage drops and iterruptions • Conducted RF • Power frequency magnetic field

Caution to conform with EC Directives

- Installation in Enclosure
  Programmable logic controllers are open-type devices that must be installed and used within conductive control cabinets. Please use the programmable logic controller while installed within a conductive shielded control cabinet. Please secure the cabinet door to the control cabinet (for conduction).
  Installation within a control cabinet greatly affects the safety of the system and aids in shielding noise from the programmable logic controller.
- Control cabinet
  - The control cabinet must be conductive.
  - Ground the control cabinet with the thickest possible grounding cable.
  - To ensure that there is electric contact between the control cabinet and its door, connect the cabinet and its doors with thick wires.
  - In order to suppress the leakage of radio waves, the control cabinet structure must have minimal openings. Also, wrap the cable holes with a shielding cover or other shielding devices.
  - The gap between the control cabinet and its door must be as small as possible by attaching EMI gaskets between them.



*1. These wires are used to improve the conductivity between the door and control cabinet.

Associated Manuals

Only the installation manual is packed together with the FX3U-CF-ADP special adapter.
For a detailed explanation of the FX3U-CF-ADP special adapter, refer to this manual.
For the hardware information and instructions on the PLC main unit, refer to the respective manuals.

⊙ Refer to these manuals
✓ Refer to the appropriate equipment manual
△ For a detailed explanation, refer to an additional manual

		Title of manual	Document number	Description	Model code
Manual for the Main Unit					
FX3U Series PLCs Main Unit					
△	Supplied Manual	FX3U Series Hardware Manual	JY997D18801	Describes FX3U Series PLC specification for I/O, wiring and installation extracted from the FX3U User's Manual - Hardware Edition. For details, refer to FX3U Series User's Manual - Hardware Edition.	-
⊙	Additional Manual	FX3U Series User's Manual - Hardware Edition	JY997D16501	Describes FX3U Series PLC specification details for I/O, wiring, installation and maintenance.	09R516
FX3UC Series PLCs Main Unit					
△	Supplied Manual	FX3UC(D,DSS) Series Hardware Manual	JY997D28601	Describes FX3UC(D,DSS) Series PLC specification for I/O, wiring and installation extracted from the FX3UC Series User's Manual - Hardware Edition. For details, refer to FX3UC Series User's Manual - Hardware Edition.	-
△	Supplied Manual	FX3UC-32MT-LT-2 Hardware Manual	JY997D31601	Describes FX3UC-32MT-LT-2 specification for I/O, wiring and installation extracted from the FX3UC User's Manual - Hardware Edition. For details, refer to FX3UC Series User's Manual - Hardware Edition.	-
△	Supplied Manual	FX3UC-32MT-LT Hardware Manual (Only Japanese document)	JY997D12701	Describes FX3UC-32MT-LT specification for I/O, wiring and installation extracted from the FX3UC User's Manual - Hardware Edition. For details, refer to FX3UC Series User's Manual - Hardware Edition.	-
⊙	Additional Manual	FX3UC Series User's Manual - Hardware Edition	JY997D28701	Describes FX3UC Series PLC specification details for I/O, wiring, installation and maintenance.	09R519
Programming for FX3G/FX3U/FX3UC Series					
⊙	Additional Manual	FX3G/FX3U/FX3UC Series Programming Manual - Basic & Applied Instruction Edition	JY997D16601	Describes FX3G/FX3U/FX3UC Series PLC programming for basic/applied instructions and devices.	09R517
Manuals for communication control					
⊙	Additional Manual	FX Series User's Manual - Data Communication Edition	JY997D16901	Details of N:N Network, parallel link, computer link and non-protocol communication (RS instructions, FX2N-232IF)	09R715
Manuals for FX3U-CF-ADP CF card special adapter					
△	Supplied Manual	FX3U-CF-ADP Installation Manual	JY997D35201	Describes installation specifications for the FX3U-CF-ADP CF card special adapter extracted from the FX3U-CF-ADP User's Manual. For details, refer to FX3U-CF-ADP User's Manual.	-
⊙	Additional Manual	FX3U-CF-ADP User's Manual (This Manual)	JY997D35401	Describes details of the FX3U-CF-ADP CF card special adapter.	09R720

Generic Names and Abbreviations Used in the Manual

Generic name or abbreviation	Description
PLC	
FX3U series	Generic name for FX3U Series PLC
FX3U PLC or main unit	Generic name for FX3U Series PLC main unit
FX3UC series	Generic name for FX3UC Series PLC
FX3UC PLC or main unit	Generic name for FX3UC Series PLC main unit
Expansion board	
Expansion board	Generic name for expansion board The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Editon of the main unit to be used for your system.
Special adapter	
Special adapter	Generic name for high-speed input/output special adapter, communication special adapter, analog special adapter, and CF card special adapter. The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Editon of the main unit to be used for your system.
CF-ADP	Abbreviated name for FX3U-CF-ADP
Extension equipment	
I/O extension unit/block	Generic name for input/output powered extension unit and input/output extension block The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
Special function unit/block or Special extension unit	Generic name for special function unit and special function block The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
Special function unit	Generic name for special function unit
Special function block	Generic name for special function block The number of connectable units, however, depends on the type of main unit. To check the number of connectable units, refer to the User's Manual - Hardware Edition of the main unit to be used for your system.
Optional unit	
Memory cassette	Generic name for FX3U-FLROM-16, FX3U-FLROM-64, FX3U-FLROM-64L
CF card or CompactFlash™ card	Generic name for GT05-MEM-128MC, GT05-MEM-256MC, GT05-MEM-512MC, GT05-MEM-1GC, GT05-MEM-2GC
Memory card adaptor	Generic name for GT05-MEM-ADPC
Peripheral unit	
Peripheral unit	Generic name for programming software, handy programming panel, and indicator
Programming tool	
Programming tool	Generic name for programming software and handy programming panel
Programming software	Generic name for programming software
GX Developer	Generic name for SW□D5C-GPPW-J/SW□D5C-GPPW-E programming software package
FX-PCS/WIN(-E)	Generic name for FX-PCS/WIN or FX-PCS/WIN-E programming software package
Handy programming panel (HPP)	Generic name for FX-30P, FX-20P(-E) and FX-10P(-E)
Indicator	
GOT1000 series	Generic name for GT15, GT11 and GT10
GOT-900 series	Generic name for GOT-A900 series and GOT-F900 series
GOT-A900 series	Generic name for GOT-A900 series
GOT-F900 series	Generic name for GOT-F900 series
ET-940 series	Generic name for ET-940 series Only manuals in Japanese are available for these products

Generic name or abbreviation	Description
Manual	
FX3U Hardware Edition	FX3U Series User's Manual - Hardware Edition
FX3UC Hardware Edition	FX3UC Series User's Manual - Hardware Edition
Programming manual	FX3G/FX3U/FX3UC Series Programming Manual - Basic and Applied Instructions Edition
Communication control Edition	FX Series User's Manual - Data Communication Edition
Analog control Edition	FX3G/FX3U/FX3UC Series User's Manual - Analog Control Edition
Positioning control Edition	FX3G/FX3U/FX3UC Series User's Manual - Positioning Control Edition

Reading the Manual

In this manual, the following formats are used for describing the common items.

Shows the manual title.

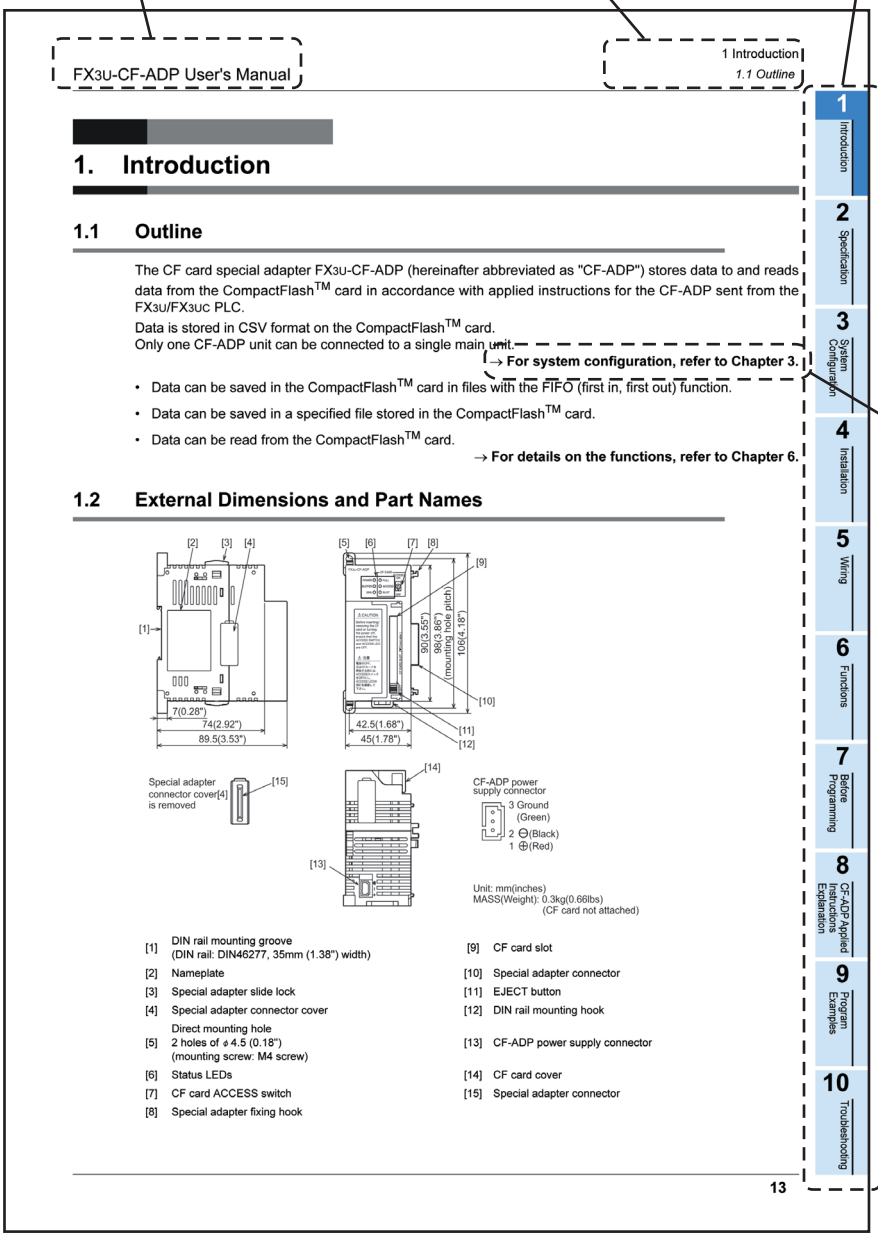
This area shows the manual title for the current page.

Shows the title of the chapter and the title of the section.

This area shows the title of the chapter and the title of the section for the current page.

Indexes the chapter number.

The right side of each page indexes the chapter number for the page currently opened.



Shows the reference.

The "→" mark indicates a reference destination and reference manual.

The above is different from the actual page, as it is provided for explanation only.

1. Introduction

1.1 Outline

The CF card special adapter FX3U-CF-ADP (hereinafter abbreviated as "CF-ADP") stores data to and reads data from the CompactFlash™ card in accordance with applied instructions for the CF-ADP sent from the FX3U/FX3UC PLC.

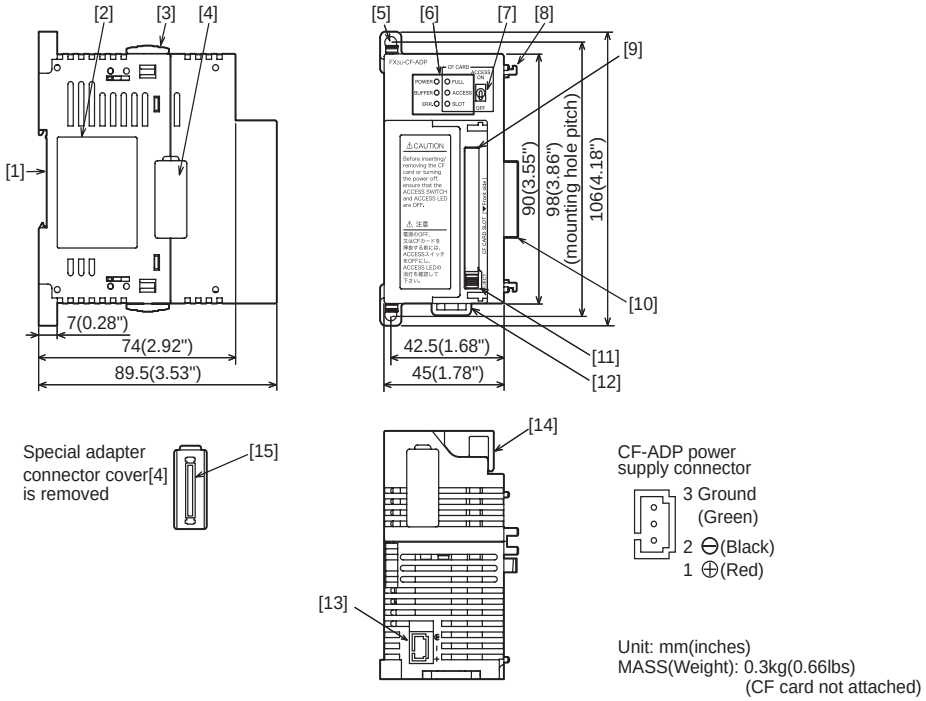
Data is stored in CSV format on the CompactFlash™ card.
Only one CF-ADP unit can be connected to a single main unit.

→ **For system configuration, refer to Chapter 3.**

- Data can be saved in the CompactFlash™ card in files with the FIFO (first in, first out) function.
- Data can be saved in a specified file stored in the CompactFlash™ card.
- Data can be read from the CompactFlash™ card.

→ **For details on the functions, refer to Chapter 6.**

1.2 External Dimensions and Part Names



Unit: mm(inches)
MASS(Weight): 0.3kg(0.66lbs)
(CF card not attached)

[1]	DIN rail mounting groove (DIN rail: DIN46277, 35mm (1.38") width)	[9]	CF card slot
[2]	Nameplate	[10]	Special adapter connector
[3]	Special adapter slide lock	[11]	EJECT button
[4]	Special adapter connector cover	[12]	DIN rail mounting hook
[5]	Direct mounting hole 2 holes of ϕ4.5 (0.18") (mounting screw: M4 screw)	[13]	CF-ADP power supply connector
[6]	Status LEDs	[14]	CF card cover
[7]	CF card ACCESS switch	[15]	Special adapter connector
[8]	Special adapter fixing hook		

1.3 Power and status LEDs

LED display	Color	Status	Description
POWER	Green	OFF	Power is not being supplied from the external power supply (24V DC).
		ON	Power is being supplied from the external power supply (24V DC).
BUFFER	Green	OFF	Data is not stored in the internal buffer.
		ON	Data is stored in the internal buffer.
ERR.	Red	OFF	No errors.
		ON	CF write error, CompactFlash™ card error, etc. has occurred.
FULL	Red	OFF	The CompactFlash™ card has free space.
		Flicker	The free space in the CompactFlash™ card is 20% or less of the full capacity.
		ON	The CompactFlash™ card has no free space. The free space in the CompactFlash™ card is 1% or less of the full capacity.
ACCESS	Red	OFF	CompactFlash™ card not accessed.
		ON	CompactFlash™ card being accessed.
SLOT	Green	OFF	The CompactFlash™ card is not inserted, or the slot is in the CompactFlash™ card unmounted status.
		ON	The CompactFlash™ card is inserted, or the slot is in the CompactFlash™ card mounted status.

2. Specification

DESIGN PRECAUTIONS DANGER

- Make sure to include the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure.
  Otherwise, malfunctions may cause serious accidents.
  1) Above all, the following components should be included: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits).
  2) Note that when the PLC main unit detects an error during self diagnosis, such as a watchdog timer error, all outputs are turned off. Also, when an error that cannot be detected by the PLC main unit occurs in an input/ output control block, output control may be disabled.
     External circuits and mechanisms should be designed to ensure safe machinery operation in such cases.

DESIGN PRECAUTIONS CAUTION

- Observe the following items. Failure to do so may cause incorrect data-writing through noise to the PLC and result in PLC failure, machine damage or other accident.
  1) Do not bundle the control line together with or lay it close to the main circuit or power line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or power line.
     Noise may cause malfunctions.
  2) Ground the shield wire or shield of a shielded cable. Do not use common grounding with heavy electrical systems
- During access (ACCESS LED is lit or flickering) to CompactFlash™ card, do not remove the CompactFlash™ card or power off the CF-ADP.
  Failure to do so may cause CompactFlash™ card failures or malfunctions.
- If the power is turned OFF while the CompactFlash™ card is being accessed (ACCESS LED is lit or flickering), the buffered data is erased. Also files or CompactFlash™ card itself may be damaged. Do not turn the power OFF while the ACCESS LED is lit or flickering.
- Do not apply excessive pressure to the power supply cable or power supply connector.
  Excessive pressure may cause damage or error.

DISPOSAL PRECAUTIONS CAUTION

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.

TRANSPORTATION PRECAUTIONS CAUTION

- The PLC is a precision instrument. During transportation, avoid impacts larger than those specified in the general specifications of the PLC main unit manual.
  Failure to do so may cause failures in the PLC.
  After transportation, verify the operations of the PLC.

2.1 General specifications

For items not listed below, specifications are the same as the of the PLC main unit.
For general specifications, refer to the manual of the PLC main unit.

→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

Item	Specification	
Ambient temperature*1	0 to 55°C (32 to 131°F) ••••• when operating, -25 to 75°C (-13 to 167°F) ••••• when stored	
Dielectric withstand voltage	500V AC for one minute	Between all terminals and ground terminal
Insulation resistance	5MΩ or more by 500V DC Megger	

*1. The upper limit of the ambient temperature shall not exceed "20°C" below the upper limit of the CompactFlash™ card operating temperature.
Example : When the upper limit of the CompactFlash™ card operating temperature is 75°C, the upper limit of the ambient temperature is 55°C.

2.2 Power supply specification

Item		Specification
Adapter driving power supply	Power supply voltage	24V DC +20% -15% Ripple (p-p) within 5%
	Permitted instantaneous power failure time	Operation continues when the instantaneous power failure is shorter than 1ms.
	Current consumption	130mA Connect a 24V DC power supply to the power supply connector.
Interface driving power supply		50mA / 5V DC 5V DC power is supplied internally from the main unit.

2.3 Performance specification

Item	Specification
Data transfer method	Depends on the applied instruction sent from the main unit.
Clock data	Operates based on the clock data in the main unit.
DOS file system	FAT16
The maximum data capacity	2GB
The maximum file size	512MB (Per 1 file)
Data format	CSV format
The number of the maximum files	63 file (When the FIFO function is not used)
FIFO functional file	1 pattern. The file name is automatically assigned.
Data storage directory	• Standard file \FX3U_CF\DATA\. (The directory name is fixed.) • FIFO file \FX3U_CF\DATA\FIFO\. (The directory name is fixed.)
File name type	8.3 file name (The extension is fixed to "CSV".) (Half-width alphanumeric characters and symbols and character strings allowed in the MS-DOS)
Number of I/O occupied points	0 point (This number is not related to the maximum number of input/output points of the PLC.)
Number of connectable units to the main unit	1 unit*1

*1. The CF-ADP is handled in the same way as communication expansion boards and communication special adapters, and occupies 1 communication channel.

2.4 CF card ACCESS switch specification

Setting item	Description
ON	Access to the CompactFlash™ card enabled
OFF*1	Access to the CompactFlash™ card disabled

*1. Turn OFF the CF card ACCESS switch, and then confirm that the BUFFER LED and ACCESS LED are completely OFF before removing the CompactFlash™ card or turning OFF the power of the CF-ADP.

2.5 CompactFlash™ card specification

Item	Specification
Operating ambient humidity	5 to 95%RH (no condensation)
Power supply voltage	3.3V 150mA or less
Connector shape	Type I
Format form	FAT16 (The CompactFlash™ card shall be formatted in accordance with the FAT16 in advance.)
Data capacity	2GB or less
Connector terminal	Gilding
No. of installable cards	1

2.6 Applicable CompactFlash™ card

The following CompactFlash™ card are applicable for the CF-ADP.

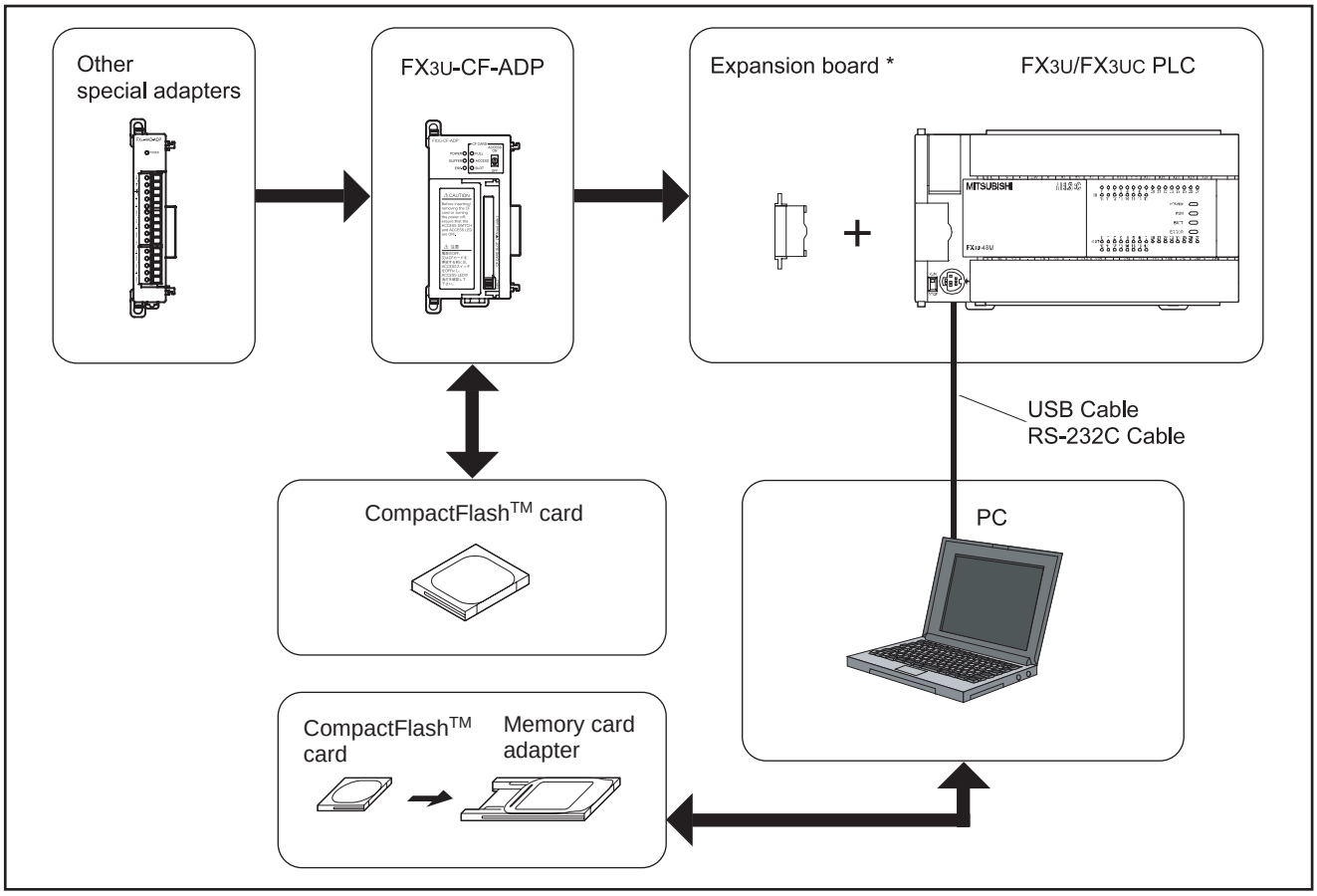
Model		Description
CompactFlash™ card	GT05-MEM-128MC	Flash ROM 128MB
	GT05-MEM-256MC	Flash ROM 256MB
	GT05-MEM-512MC	Flash ROM 512MB
	GT05-MEM-1GC	Flash ROM 1GB
	GT05-MEM-2GC	Flash ROM 2GB

Caution

The life of a CompactFlash™ card is expired when data is written to it a specified number of times.
Generally, at the end of the operational life, the CompactFlash™ card has reduced capabilities.
Please use it ensuring sufficient availability.

3. System Configuration

3.1 General configuration



*An expansion board is required to connect the CF-ADP with the FX3U/FX3UC-32MT-LT PLCs.

Component list

Part name	Model name	Remarks
CF card special adapter	FX3U-CF-ADP	An expansion board is required to connect the CF-ADP with the FX3U/FX3UC-32MT-LT PLCs.
PLC	FX3U/FX3UC PLC	-
CompactFlash™ card	GT05-MEM-128MC, GT05-MEM-256MC, GT05-MEM-512MC, GT05-MEM-1GC, GT05-MEM-2GC	CompactFlash™ cards available for the CF-ADP.
Memory card adapter	GT05-MEM-ADP	The memory card adapter is used to convert a CF card into a memory card (Type II).
PC software	GX Developer	PLC programming software.
PC	-	-
USB cable	FX-USB-AW	Cable with RS-422/USB converter between a FX PLC and PC.
RS-232C cable	F2-232CAB-1	PC connection cable and interface.
	FX-232AWC-H	
	FX-422CAB0	

3.2 Applicable PLC

3.2.1 Connectable PLC

Model name	Applicability
FX3U Series PLC*1	Ver. 2.61 and later Only one CF-ADP unit can be connected to a main unit.
FX3UC Series PLC*1*2	Ver. 2.61 and later Only one CF-ADP unit can be connected to a main unit.

The version number can be checked by reading the last three digits of device D8001.

*1. An expansion board is required to connect the CF-ADP with FX3U/FX3UC-32MT-LT PLCs.

*2. The FX3UC-32MT-LT-2 PLC is due to be upgraded later.

3.2.2 Applicable versions of the programming tool

1. GX Developer

Use the programming tool with the following version number to create programs for the CF-ADP of the FX3U/FX3UC Series PLC.

Software	Applicability
GX Developer • SW□D5C(F)-GPPW-J • SW□D5C(F)-GPPW-E	Ver.8.82L or later

Caution

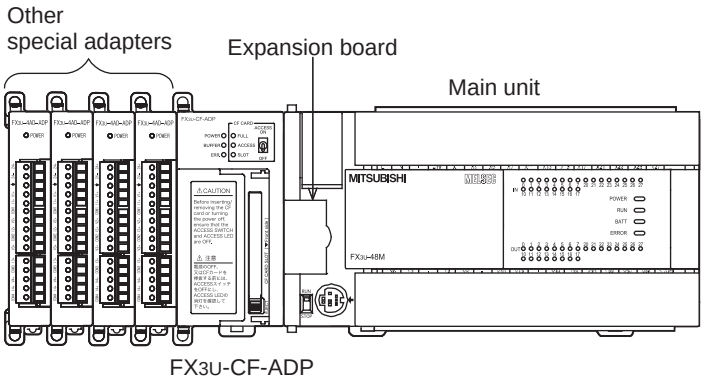
If a programming tool with the wrong version number is used, programming will not be possible.

3.3 Connection with PLC

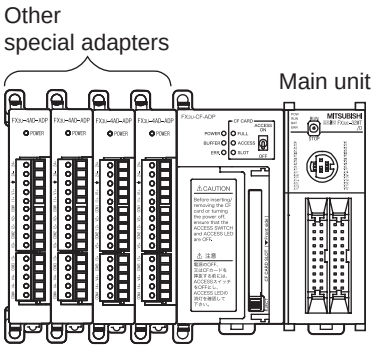
The CF-ADP connects with a FX3U/FX3UC PLC via an interface connector.
Only one CF-ADP unit can be connected to the FX3U/FX3UC PLC. An expansion board is required to connect the CF-ADP with the FX3U/FX3UC-32MT-LT PLCs.
For details of assignment of channel numbers in the main unit, refer to the following.

→ **Refer to Section 3.4**

1. FX3U/FX3UC-32MT-LT PLC



2. FX3UC(D, DSS) PLC



FX3U-CF-ADP

3.4 Assignment of channels

The CF-ADP is handled in the same way as communication expansion boards and communication special adapters for PLCs. Its channel number ("ch1" or "ch2") is assigned automatically in the order of the position from the main unit. This channel number is used in applied instructions for the CF-ADP.
The channel number is assigned as shown below.

1. FX3U/FX3UC-32MT-LT(-2) PLC

- When using channel 1 (ch1)

(ch2)		ch1			
Communication special adapter	Analog special adapter	CF-ADP	Analog special adapter	FX3U-CNV-BD	FX3U, FX3UC-32MT-LT(-2) Main unit

- When using channel 2 (ch2)

	ch2		(ch1)	
Analog special adapter	CF-ADP	Analog special adapter	Communication expansion board	FX3U, FX3UC-32MT-LT(-2) Main unit

Caution on using the CF-ADP

The CF-ADP is handled in the same way as communication expansion boards and communication special adapters, and occupies one communication channel.

2. FX3UC(D, DSS) PLC

- When using channel 1 (ch1)

(ch2) ch1

Communication special adapter	Analog special adapter	CF-ADP	Analog special adapter	FX3UC(D, DSS) Main unit

- When using channel 2 (ch2)

ch2 (ch1)

CF-ADP	Analog special adapter	Communication special adapter	Analog special adapter	FX3UC(D, DSS) Main unit

Caution on using the CF-ADP

The CF-ADP is handled in the same way as communication special adapters, and occupies one communication channel.

4. Installation

INSTALLATION PRECAUTIONS **DANGER**

- Make sure to shut down all phases of the power supply externally before installing the FX3U-CF-ADP.
  Failure to do so may cause electric shock or damage to the product.

INSTALLATION PRECAUTIONS **CAUTION**

- Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl_2, H_2S, SO_2, or NO_2), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind. If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur.
- Do not touch the conductive parts of the product directly.
  Doing so may cause device failures or malfunctions.
- Install the product securely using a DIN rail or mounting screws.
- Install the product on a flat surface.
  If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Be sure to remove the dust proof sheet from the PLC's ventilation port when installation work is completed.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Connect the FX3U-CF-ADP securely to special adapter connector.
  Loose connections may cause malfunctions.
- Connect the power connector of the power supply cable securely to the CF-ADP power supply connector.
  Loose connections may cause malfunctions.
- When inserting a CompactFlash™ card into the FX3U-CF-ADP, push it into the CF card slot until the EJECT button pops out.
  Loose connections may cause malfunctions.
- Before inserting/removing a CompactFlash™ card into/from the FX3U-CF-ADP, set the CF card ACCESS switch to OFF and confirm that the BUFFER LED and ACCESS LED are both OFF.
  Failure to do so may corrupt data within the CompactFlash™ card.
- When removing a CompactFlash™ card from the FX3U-CF-ADP, make sure to support the CompactFlash™ card by hand, as it may pop out.
  Failure to do so may cause the CompactFlash™ card to fall from the FX3U-CF-ADP and break.
- Turn off the power to the PLC before attaching or detaching the following devices.
  Failure to do so may cause device failures or malfunctions.
  - Peripheral devices, display modules, expansion boards and special adapters
  - I/O extension units/blocks, FX Series terminal block and the special function units/blocks
  - Battery and memory cassette

Only one CF-ADP unit can be connected to the left side of the main unit or special adapter.
An expansion board is required to connect the CF-ADP with the FX3U/FX3UC-32MT-LT PLCs.
For details, refer to the respective PLC manual.

→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

The CF-ADP may be installed in a control cabinet with a 35mm (1.38") wide DIN46277 DIN rail mounting or M4 screw direct mounting.
When the CF-ADP is connected to a FX3UC PLC, the direct mounting method is not possible.

4.1 CF-ADP Connection

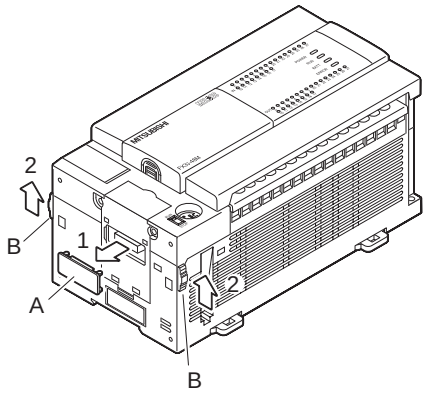
An expansion board should be installed before connection of the CF-ADP. An expansion board is not required when the CF-ADP is connected to a FX3UC(D, DSS) PLC.
This section explains an example where the CF-ADP is connected to a FX3U PLC. For connection to another PLC, refer to the respective PLC manual.

→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

1 **Remove the special adapter connector cover (A in the figure on the right) from the expansion board.**

It is assumed that an expansion board has been installed in advance. For the expansion board installation method, refer to the respective PLC manual.

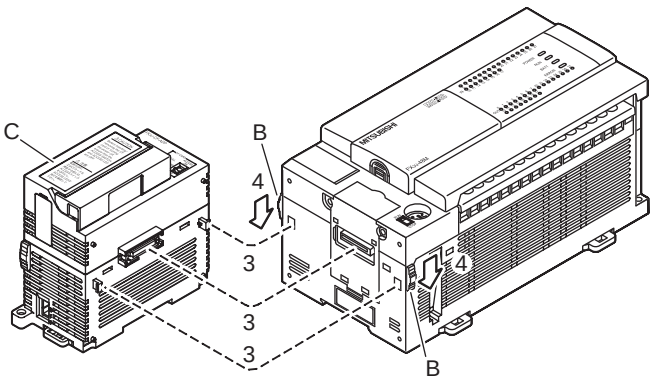
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**



2 **Slide the special adapter connecting hooks (B in the figure on the right) of the main unit upwards.**

3 **Connect the CF-ADP (C in the figure on the right) to the main unit as shown in the figure on the right.**

4 **Slide the special adapter connecting hooks (B in the figure on the right) of the main unit downwards to secure the CF-ADP (C in the figure on the right).**



4.2 DIN rail mounting

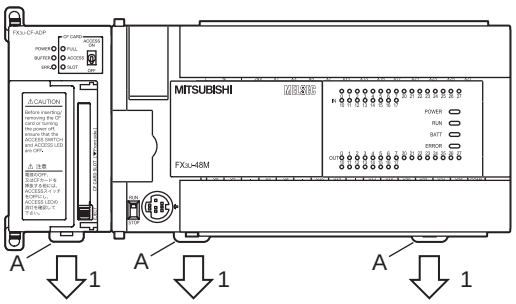
The CF-ADP may be mounted on a 35mm (1.38") wide DIN46277 (DIN rail).
Connect the CF-ADP to the PLC main unit before attaching the CF-ADP to a DIN rail.
This section explains an example where the CF-ADP is connected to a FX3U PLC. For the DIN rail mounting method for other PLCs, refer to the respective PLC manual.

→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

1 Push out all DIN rail mounting hooks (A in the figure on the right).

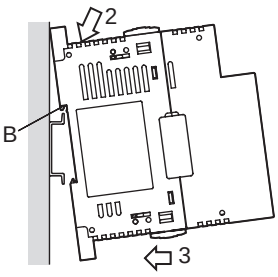
It is assumed that the CF-ADP has been connected in advance. For the CF-ADP connection method, refer to the following.

→ **Refer to Section 4.1.**

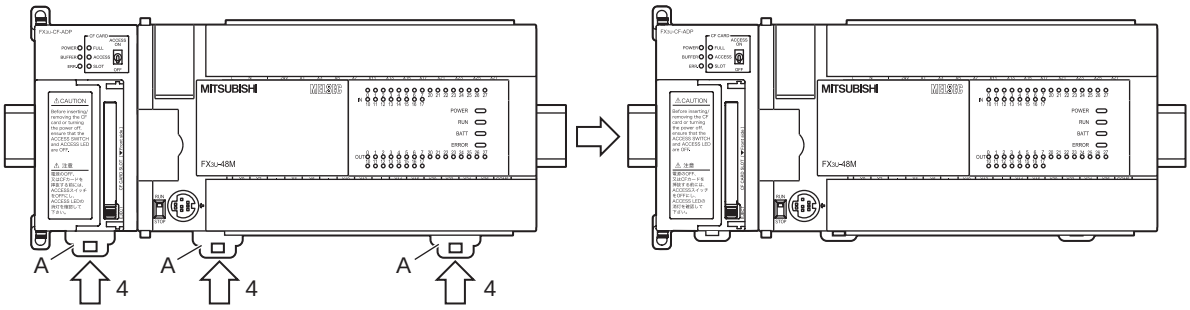


2 Fit the upper edge (B in the figure on the right) of the DIN rail mounting groove onto the DIN rail.

3 Push the product onto the DIN rail.



4 Lock the DIN rail mounting hooks (A in the following figure) while pressing the PLC against the DIN rail.



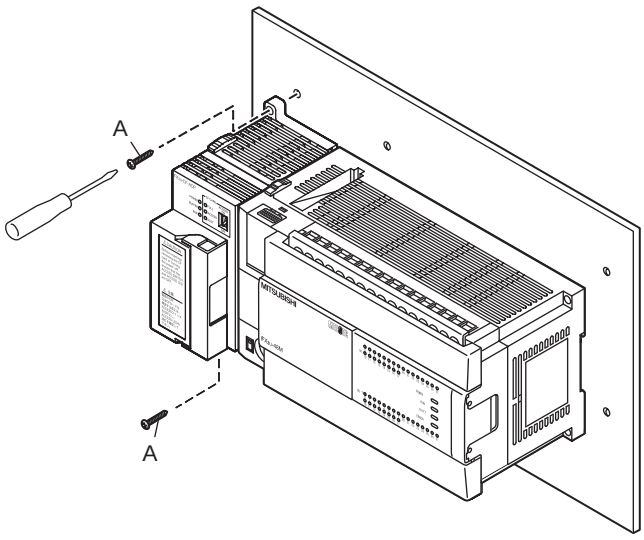
4.3 Direct mounting

When the CF-ADP is connected to a FX3U PLC, the CF-ADP may be mounted directly on a panel surface using screws. The direct mounting method is not available when the CF-ADP is connected to a FX3UC PLC. Connect the CF-ADP to the main unit before attaching it to the panel surface.
For mounting, refer to the following manual.

→ **Refer to the FX3U Hardware Edition**

1 Create mounting holes in the mounting surface according to the external dimensions diagram.

2 Fit the CF-ADP to the mounting holes and tighten with M4 screws (A in the figure on the right).



Also fit the main unit to the mounting holes and tighten with M4 screws. For the main unit connection method, refer to the following.

→ **Refer to the FX3U Hardware Edition**

It is assumed that the CF-ADP has been connected in advance.
For the CF-ADP connection method, refer to the following.

→ **Refer to Section 4.1.**

For the screw positions and number of screws in the CF-ADP, refer to the dimensional outline drawing as follows.

→ **Refer to Section 1.2.**

For the screw positions and number of screws in the main unit, refer to the following manual.

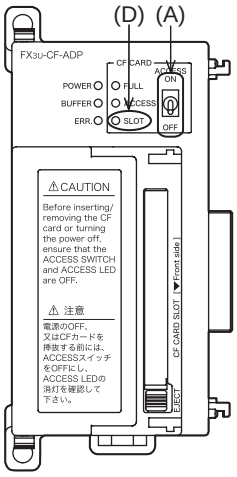
→ **Refer to the FX3U Hardware Edition**

4.4 Inserting and Removal Procedures

4.4.1 Inserting the CompactFlash™ card

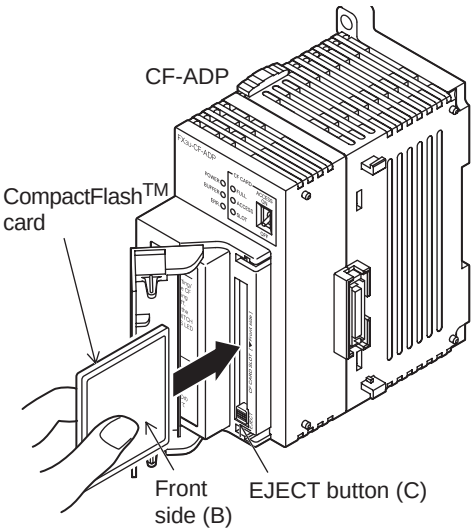
The CompactFlash™ card can be inserted when the CF-ADP is power off.
When the power supply of CF-ADP is ON and it inserts the CompactFlash™ card, make sure to perform of the following procedures.

1 **Set the CF card ACCESS switch to OFF (A in the figure on the right) in the CF-ADP. Confirm that the POWER LED is lit.**



2 **Open the CF card cover.**

Insert the CompactFlash™ card into the CF card slot with the front side (side B in the figure on the right) facing the right side of the CF-ADP until the EJECT button (side C in the figure on the right) pops out.



3 **Confirm that the CF card ACCESS LED is lit or flickers and turns OFF, and then the SLOT LED (D in the figure on the right) turns ON.**

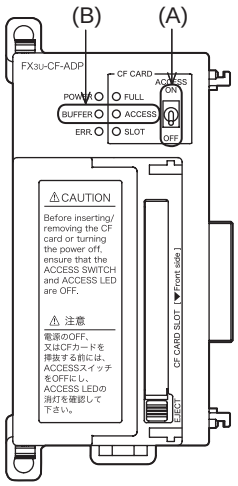
4 **Close the CF card cover.**
Set the CF card ACCESS switch to ON.

4.4.2 Removing the CompactFlash™ card

The CompactFlash™ card can be removed when the CF-ADP is power off.

When the power supply of CF-ADP is ON and it removes the CompactFlash™ card, make sure to perform of the following procedures.

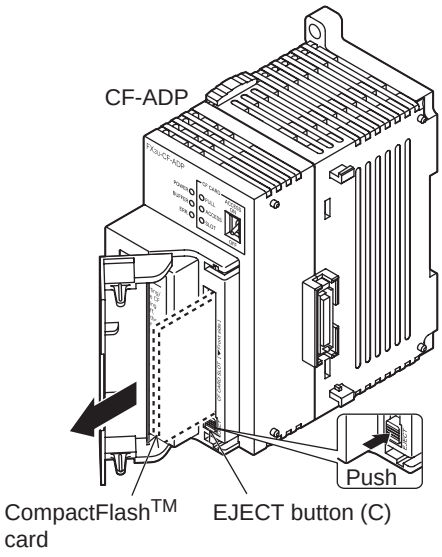
1 **Set the CF card ACCESS switch of the CF-ADP to OFF (A in the figure on the right), and make sure that the CF card ACCESS LED and BUFFER LED (B in the figure on the right) both turn off.**
(When the CF card ACCESS LED turns off, the CompactFlash™ card can be removed even when the CF-ADP is powering on.)



CAUTION

When the CF card ACCESS LED is lit or flickering, do not removing the CompactFlash™ card or power off the CF-ADP. Doing so may cause data corruption or malfunction.

2 **Open the CF card cover.**
Push the EJECT button (C in the figure on the right) of the CF-ADP to push out the CompactFlash™ card and remove it.



CAUTION

When ejecting the CompactFlash™ card, support it by hand since it may pop out.

Failure to do so may cause the CompactFlash™ card to fall leading to failure or damage of the card.

5. Wiring

DESIGN PRECAUTIONS DANGER

- Make sure to include the following safety circuits outside the PLC to ensure safe system operation even during external power supply problems or PLC failure.
  Otherwise, malfunctions may cause serious accidents.
  1) Above all, the following components should be included: an emergency stop circuit, a protection circuit, an interlock circuit for opposite movements (such as normal vs. reverse rotation), and an interlock circuit (to prevent damage to the equipment at the upper and lower positioning limits).
  2) Note that when the PLC main unit detects an error during self diagnosis, such as a watchdog timer error, all outputs are turned off. Also, when an error that cannot be detected by the PLC main unit occurs in an input/ output control block, output control may be disabled.External circuits and mechanisms should be designed to ensure safe machinery operation in such cases.

DESIGN PRECAUTIONS CAUTION

- Observe the following items. Failure to do so may cause incorrect data-writing through noise to the PLC and result in PLC failure, machine damage or other accident.
  1) Do not bundle the control line together with or lay it close to the main circuit or power line. As a guideline, lay the control line at least 100mm (3.94") or more away from the main circuit or power line.
     Noise may cause malfunctions.
  2) Ground the shield wire or shield of a shielded cable. Do not use common grounding with heavy electrical systems
- During access (ACCESS LED is lit or flickering) to CompactFlash™ card, do not remove the CompactFlash™ card or power off the CF-ADP.
  Failure to do so may cause CompactFlash™ card failures or malfunctions.
- If the power is turned OFF while the CompactFlash™ card is being accessed (ACCESS LED is lit or flickering), the buffered data is erased. Also files or CompactFlash™ card itself may be damaged. Do not turn the power OFF while the ACCESS LED is lit or flickering.
- Do not apply excessive pressure to the power supply cable or power supply connector.
  Excessive pressure may cause damage or error.

WIRING PRECAUTIONS DANGER

- Make sure to cut off all phases of the power supply externally before attempting wiring work.
  Failure to do so may cause electric shock or damage to the product.

WIRING PRECAUTIONS CAUTION

- Connect the DC power supply wiring to the dedicated terminal described in this manual.
  If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
- Connect the DC power supply wiring to the dedicated connector described in this manual.
  If an AC power supply is connected to a DC power supply connector, the PLC will burn out.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
  Failure to do so may cause fire, equipment failures or malfunctions.

STARTUP AND MAINTENANCE PRECAUTIONS DANGER

- Make sure to connect the battery correctly. Do not charge, disassemble, heat, short-circuit, or expose the battery to fire.
  Doing so may rupture or ignite it.
- Do not touch any terminal while the PLC's power is on.
  Doing so may cause electric shock or malfunctions.
- Before modifying or disrupting the program in operation or running the PLC, carefully read through this manual and the associated manuals and ensure the safety of the operation.
  An operation error may damage the machinery or cause accidents.

STARTUP AND MAINTENANCE PRECAUTIONS ⚠ CAUTION

- Do not disassemble or modify the PLC.
  Doing so may cause fire, equipment failures, or malfunctions.
  For repair, contact your local Mitsubishi Electric distributor.
- Turn off the power to the PLC before attaching or detaching the following devices.
  Failure to do so may cause device failures or malfunctions.
  - Peripheral devices, display modules, expansion boards and special adapters
  - I/O extension units/blocks, FX Series terminal block and the special function units/blocks
  - Battery and memory cassette

5.1 Which Power Supply Cable to Use

The cable for connecting the CF-ADP power supply connector with the power supply is described here.

5.1.1 Power supply cable

A dedicated power supply cable offered as an accessory of the CF-ADP is available.

Model name	Length	Remarks
FX2NC-100MPCB	1m (3'3")	Accessory of CF-ADP

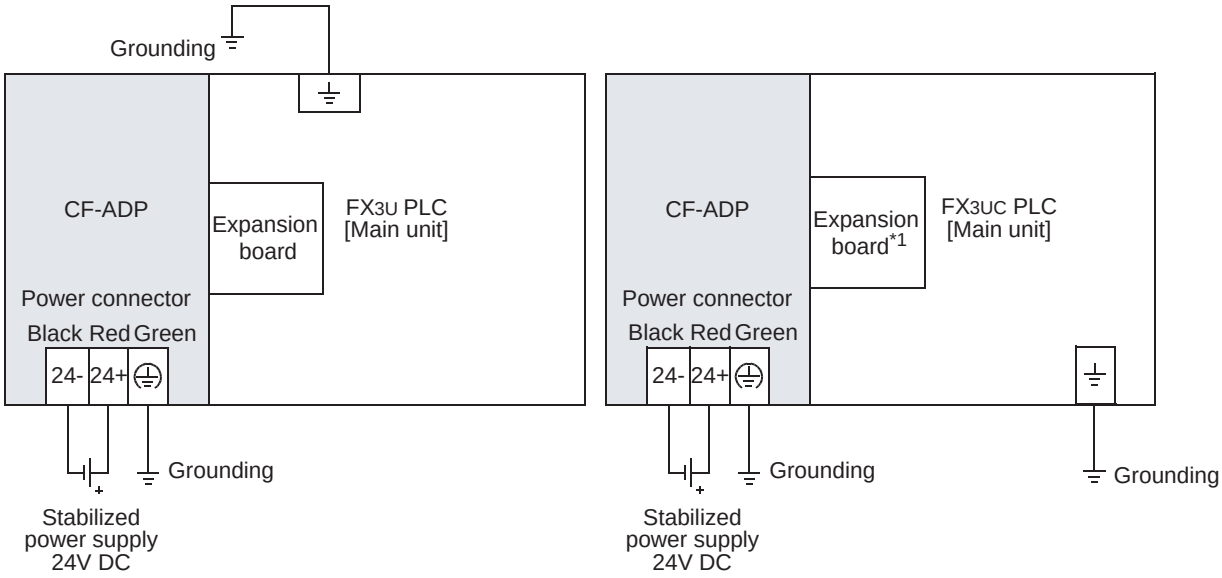
5.1.2 Preparing the power cable by yourself

To prepare the power cable by yourself, use the following wiring material and connector type.

Model name	Specifications/model name
Wire size	AWG 24(0.2mm^2)
Crimp terminal	1602-0069 (Manufactured by Molex Incorporated)
Housing	51030-0330 (Manufactured by Molex Incorporated)

5.2 Power Supply Wiring

5.2.1 Power supply wiring



*1. The expansion board is required when connecting with the FX3UC-32MT-LT PLC.

Power-on/off timing

The CF-ADP power supply should be turned ON simultaneously with or before the power supply of the PLC main unit. Before turning the power OFF, ensure the safety of the system and then simultaneously turn the main unit, CF-ADP, and other extension equipment (the special extension equipment is included) OFF.
For details, refer to the respective PLC manual.

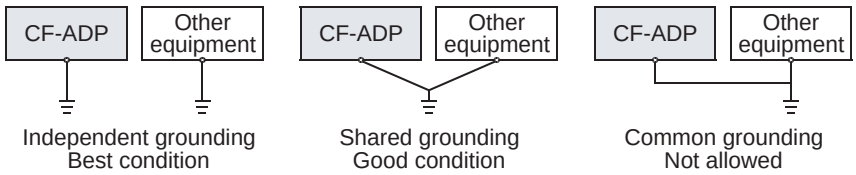
→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

5.3 Grounding

Ground the cables as follows

- The grounding resistance should be 100Ω or less.
- Independent grounding should be established whenever possible.
  Independent grounding should be performed for best results.
  When independent grounding is not configured, perform "shared grounding" as shown in the following figure.
  For details, refer to the respective PLC manual.

→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**



- The grounding point should be close to the CF-ADP, and all grounding wires should be as short as possible.

5.4 Power OFF procedure

Make sure to perform either of the following procedures when turning OFF the power of the CF-ADP.

- Power OFF procedure using the CF card ACCESS switch

→ **Refer to Subsection 5.4.1**

- Power OFF procedure using the applied instruction for the CF-ADP

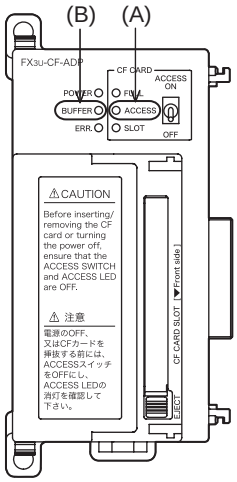
→ **Refer to Subsection 5.4.2**

5.4.1 Power OFF procedure using the CF card ACCESS switch

1 **Set the main unit to the STOP mode, or set the applied instruction for the CF-ADP to the unactuated status.**

2 **Turn OFF the CF card ACCESS switch, and then confirm that the ACCESS LED (A in the figure on the right) and BUFFER LED (B in the figure on the right) are completely OFF.**

3 **Turn the power of the CF-ADP OFF.**



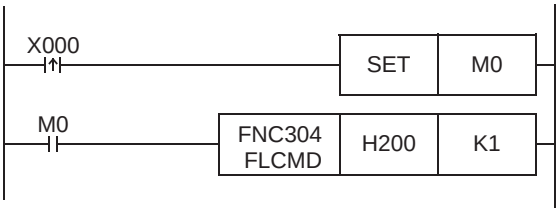
5.4.2 Power OFF procedure using the applied instruction for the CF-ADP

1 **Execute the FLCMD instruction to unmount the CompactFlash™ card.**

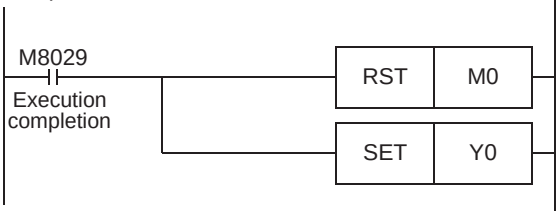
2 **Confirm that the FLCMD instruction is completed normally.**

3 **Turn the power of the CF-ADP OFF.**

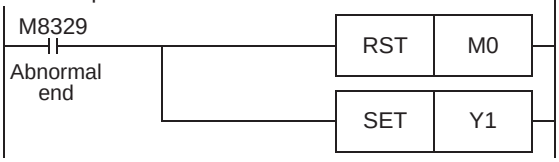
1.Execute the FLCMD instruction,



2.Confirm that the FLCMD instruction is normally completed.
3.Turn the power of the CF-ADP OFF.



If the FLCMD instruction is abnormally completed, do not turn the power of the CF-ADP OFF .



5.4.3 Caution on power OFF

If the power is turned OFF while the CompactFlash™ card is being accessed (ACCESS LED is lit or flickering), the buffered data is erased. Also files or CompactFlash™ card itself may be damaged.
Do not turn the power OFF while the ACCESS LED is lit or flickering.

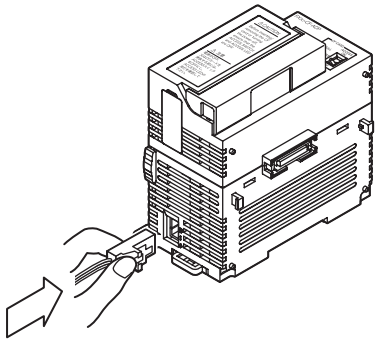
5.5 Connection of the power supply cable

The CF-ADP receives and supplies power through the built-in dedicated power connector.

5.5.1 Connection/removal of the power supply cable

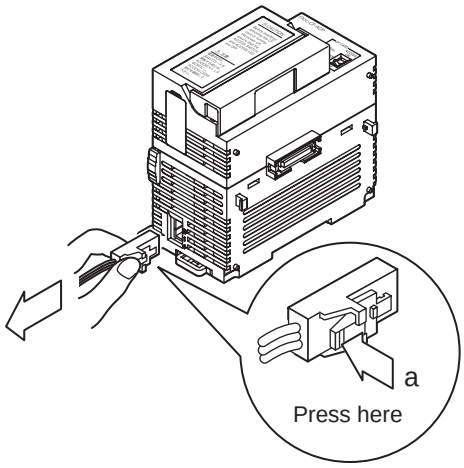
- Connection

Connect the power supply cable after confirming the connector direction.



- Removal

Squeeze the power cable connector at "a" and disconnect it in the direction of the arrow.



6. Functions

6.1 Details of functions

The user can perform the following procedures for CompactFlash™ cards using applied instructions for the CF-ADP.

- Creating FIFO function files inside the CompactFlash™ card.
  (Only one pattern is available for FIFO function files. Multiple FIFO function files are created automatically with a predetermined file name. If the created FIFO function files exceed the allowable capacity, old files are deleted. The FIFO function is executed in units of files.)
- Creating files inside the CompactFlash™ card.
  (Up to 63 files can be created.)
- Deleting specified files stored in the CompactFlash™ card.
- Writing bit data, word data, double-word data, floating point data and character string data to a specified file stored in the CompactFlash™ card.
  Data can be written to the CompactFlash™ card using the following two methods:
  - Data is directly written to the CompactFlash™ card without using the internal buffer. Up to 254 data points can be written to one line.
  - Data is collected in the internal buffer. When the internal buffer becomes full, data is written to the CompactFlash™ card. Up to 254 data points can be written to one line.
- Forcibly writing data of a specified file stored in the internal buffer to the CompactFlash™ card.
- Reading the number from the final line in a specified file stored in the CompactFlash™ card.
- Reading the data from a specified line in a specified file stored in the CompactFlash™ card.
  (Up to 254 data points can be read from one line.)
- Writing the data name.
  (Up to 254 data points names can be written.)
- Formatting the CompactFlash™ card.
- Sending a mount command to the CompactFlash™ card.
- Sending an unmount command to the CompactFlash™ card.

6.2 Status information

The user can read the following status information using applied instructions for the CF-ADP.

- Detecting that a CompactFlash™ card is mounted.
- Detecting that the CompactFlash™ card is full.
- Detecting errors that have occurred in the CF-ADP.
- Reading error codes and details of error codes of the CF-ADP.
- Data capacity of the CompactFlash™ card. (Unit: kB)
  1(MB)=1024(kB), 1(GB)=1024(MB)=1,048,576(kB)
  Capacity less than 1 kB is regarded as "1 kB".
- Used space of the CompactFlash™ card. (Unit: kB)
  1(MB)=1024(kB), 1(GB)=1024(MB)=1,048,576(kB)
  Capacity less than 1 kB is regarded as "1 kB".
- Free space of the CompactFlash™ card. (Unit: kB)
  1(MB)=1024(kB), 1(GB)=1024(MB)=1,048,576(kB)
  Capacity less than 1 kB is regarded as "1 kB".
- File ID list.
  (File ID: The file name is associated with the file ID, and the file ID is used in sequence programs (applied instructions).)
- CF-ADP version information.

7. Before Programming

This chapter describes several items that should be known before programming.

- File format available in the CF-ADP
- Files created by the user
- Characters available in files
- Data size calculation
- Data writing destination
- File ID
- FIFO file
- Directory structure
- Date/time setting
- General rules for applied instructions

7.1 File format available in the CF-ADP

Files in the "csv" format are available in the CF-ADP.
Files are created by the CF-ADP and by the user.

7.1.1 Files created by the CF-ADP

Files in the "csv" format created by the CF-ADP are as follows. The CF-ADP can read and write files whose data is separated by comma (,), and line-feed by "CR + LF".
One line can store up to 254 data points.
For characters available in files, refer to Subsection 7.1.3.

CSV file

(1)				(2)								
Index	,	DATE TIME	,	Data name	,	Data name	,	Data name	,	•••	,	Data name	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
Index	,	Year/Month/Day Hour:Minute:Seconds	,	data	,	data	,	data	,	•••	,	data	CR	LF
(3)	(4)	(5)	(6)					(7)					(8)	

Contents of files in the "csv" format

No.	Contents of data	Description	Remark
(1)	Index,DATE TIME,	When the file name is added, the Index, date and time are added automatically.	-
(2)	Data name	Character string consisting of up to 32 half-width/full-width characters	Refer to Subsection 7.1.3.
(3)	Index	6 digits(*****1 to *32767) Numeric values should be consecutive, and in ascending order.	Decimal number " (space)" and "+ (plus)" are used by the system. Index values in one file should be different from each other.
(4)	,	Comma : 1 character	-
(5)	year/Month/Day Hour:Minute:Seconds	None : Null yyyy/mm/dd hh:mm:ss : 19 characters yy/mm/dd hh:mm:ss : 17 characters dd/mm/yyyy hh:mm:ss : 19 characters dd/mm/yy hh:mm:ss : 17 characters mm/dd/yyyy hh:mm:ss : 19 characters mm/dd/yy hh:mm:ss : 17 characters hh:mm:ss : 8 characters	The date and time are updated when data is additionally written or overwritten if the time stamp is set.
(6)	,	Comma : 1 character	-
(7)	data	Bit : 1 character Decimal 16-bit : 6 characters Decimal 32-bit : 11 characters Hexadecimal 16-bit : 4 characters Hexadecimal 32-bit : 8 characters Real numbers(Floating point data) Exponent type : ±#.#######E±## : 14 characters Character string : Varies depending on the character size. (512 half-width/full-width characters maximum)	The maximum data size is 16 kB for each Index. (One character string should be within 1 kB (512 full-width characters).)
(8)	CR+LF	Return code at line end	Line feed

7.1.2 Files created by the user

The contents of files created by the user should be same as files created by the CF-ADP (refer to Subsection 7.1.1).
For characters available in files, refer to Subsection 7.1.3.
For cautions on file creation, refer to the following description.

Caution

- Cautions on creating the 1st column
  - Enter the line number in decimal number (1 to 32767 in 6 digits or less).
  - Enter the line number consecutively in ascending order.
  - Use a line number only once.
  - Do not use "+ (plus)" in the line number.
- Cautions on creating the 2nd column (Year/Month/Day Hour:Minute:Seconds).
  - Enter the date and time in the specified configuration.
    Enter "Index, data, •••, CF+LF" so that the 2nd column area is secured.
- Enter data in the 3rd column and so on. Up to 254 data points can be entered.
- Make sure to separate data with comma (,).
- Use "CR+LF" as the line feed code.
- Cautions on reading data from and writing data to files created by the user
  - Associate the file name with the file ID using the FLCRT instruction.
  - Files created by the user cannot be overwritten.
- Cautions on reading data from files created by the user
  When reading data from a file using the FLRD instruction, match the data type for each saved data point. Specify the same data type.
  If the data types do not agree, data cannot be read normally.

7.1.3 Characters available in files

Following characters are available in files.

Type	Available characters	Display type	Number of digits[*1]	Remark
Index	'0' to '9' , ' ' (space) , '+' ,	##### +#####	6 digits	"+" is used by the system.[*2]
DATE TIME	'0' to '9' , '/' , ':'	Selectable	1 to 19 digits	The display format is selectable.[*6]
Bit	'0','1'	#	1 digits	-
Decimal 16-bit	'0' to '9' , '-' , ' ' (space)	##### -#####	6 digits	Do not add "+" to a positive value. Add a space.
Decimal 32-bit	'0' to '9' , '-' , ' ' (space)	########## -##########	11 digits	Do not add "+" to a positive value. Add a space.
Hexadecimal 16-bit	'0' to '9','A' to 'F', 'a' to 'f'	####	4 digits	-
Hexadecimal 32-bit	'0' to '9','A' to 'F', 'a' to 'f'	########	8 digits	-
Floating point data	'0' to '9','E','e','+','-', ' '(space),'.' Available numeric values[*7] 0, ±1.1754944E-38 to ±3.4028233E+38 Enter "NaN" when data is non numeric, un-normalized or infinite.	#.#######E+## #.#######E-## -#.#######E+## -#.#######E-## NaN	14 digits	Do not add "+" to a positive value. Add a space. Make sure to add "+" or "-" to the exponent part after "E". When data is non numeric, un-normalized or infinite, a space is added and "NaN" is set.
Character string	ASCII characters and 2-byte characters such as shift JIS characters defined by region[*3]	Arbitrary[*4]	Up to 512 half-width/full-width characters (1024 bytes) per data point (The entire amount of data in one line should be 16 kB or less.)	Do not use control codes or half-width symbols in character strings.[*5]

*1. The data digits are fixed by the data type in the CF-ADP.
Data created using a personal computer cannot be overwritten because the data digits do not match.

*2. A "+" added to the Index value is used by the CF-ADP in the system, and cannot be deleted.
If data is overwritten using a personal computer, etc., a "+" added by the CF-ADP may be deleted and the CF-ADP may malfunction.

*3. UNICODE characters are not available.
Use characters available in PLCs such as shift JIS characters (which are set by region).
Mitsubishi recommends US-ASCII characters when files are used in an environment that caters to several languages. Use US-ASCII characters if UNICODE characters are set by region.
Use a personal computer in an environment that is used to create data or program when reading data.

*4. Control codes such as line feed codes (CR and LF), half-width commas (,) and double quotation marks (") are not available.

*5. Mitsubishi does not recommend the following symbols.
They may be automatically converted by some application software used for data processing.
When using the following symbols, confirm the application software specifications.
Apostrophe ('), caret (^), backslash (\), slash (/), at mark (@) and equal sign (=)

*6. The expression of date and time depends on the setting of the region. Check the used method.

*7. When data is read in floating point format, the data point is converted from the head to the position which can be read as a numeric value if characters outside the floating point specification are contained in the data.

7.1.4 Data size calculation

When calculating the data size, use the following formula in accordance with the byte count shown in the table below.

Contents of data	Used characters	Number of bytes	Symbol	Remark
Index	6 digits (expressed in a decimal number from "1" to "32767") Space is put in for unused digits. Plus signs (+) are used in some systems.	6 bytes	-	Decimal 6 digits
,	1 character	1 byte	-	Comma
year/Month/Day Hour:Minute:Seconds	None	0 byte	(a)	The expression of date and time depends on the setting of the region. Check the used method.
	yyyy/mm/dd hh:mm:ss	19 bytes		
	yy/mm/dd hh:mm:ss	17 bytes		
	dd/mm/yyyy hh:mm:ss	19 bytes		
	dd/mm/yy hh:mm:ss	17 bytes		
	mm/dd/yyyy hh:mm:ss	19 bytes		
	mm/dd/yy hh:mm:ss	17 bytes		
	hh:mm:ss	8 bytes		
,	1 character	1 byte	-	Comma
data	Bit	1 byte	(b)	-
	Decimal 16-bit	6 bytes		
	Decimal 32-bit	11 bytes		
	Hexadecimal 16-bit	4 bytes		
	Hexadecimal 32-bit	8 bytes		
	Real numbers(Floating point data) Exponent expression type=±#.#######E±##	14 bytes		
	Character string (512 half-width/full-width characters maximum)	Character string size (1024 bytes maximum)		
CR+LF	Return code at line end	2 bytes	-	Line feed

Calculation formula for the byte count that can be written at one time Number of data points : n ($n \leq 254$)

Calculation formula

$$\text{Written byte count} = 9+(a)+\sum_{1}^{n}(1+(b))$$

Example of the maximum numeric value (When there are 254 floating point data points)

$\text{Written byte count} = 9+19+\sum_{1}^{254}\{(1+14)\}$ (Sum of 254 data points) = 3838 byte $\approx$ 3.75kB

Example of character string

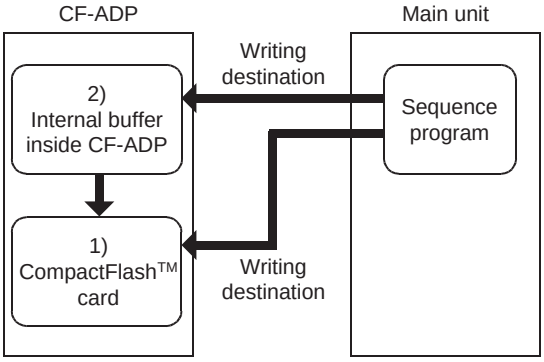
$\text{Written byte count} = 9+19+\sum_{1}^{n}\{(1+(b))\}$ (Sum of "n" character strings) $\leq$ 16kB

Caution

- When overwriting data, match the data type and byte count in the line.
- Data is not overwritten or read normally if the data type or byte count is different.

7.1.5 Data writing destination

Data can be written to two destinations, the CompactFlash™ card and the internal buffer inside the CF-ADP.



1. When data is written to the CompactFlash™ card

When the CompactFlash™ card is specified as the writing destination in the applied instruction for the CF-ADP, data is directly written to the CompactFlash™ card.

Because data is written to the CompactFlash™ card every time the instruction is executed, the user should pay attention to the number of times data is written to the CompactFlash™ card.

For example, if data is written to the CompactFlash™ card every minute, data is written 100,000 times in approximately 2 months.

Even if the power is turned OFF after data is written normally, the written data is not cleared.

2. When data is written to the internal buffer inside the CF-ADP

When the Internal buffer inside the CF-ADP is specified as the writing destination in the applied instruction for the CF-ADP, data is written to the internal buffer inside the CF-ADP. This type of writing is not counted as a data write to the CompactFlash™ card. Data writing from the buffer inside the CF-ADP to the CompactFlash™ card is counted as a data write to the CompactFlash™ card. However, attention is required because data is cleared in the following cases.

Data is cleared at the following times, and data is written from the internal buffer inside the CF-ADP to the CompactFlash™ card at the following times.

Times when the internal buffer inside the CF-ADP is cleared

- When the file deletion command or file formatting command is executed
- When the CompactFlash™ card is pulled out
- When the power is turned OFF using any procedure other than the specified power OFF procedure

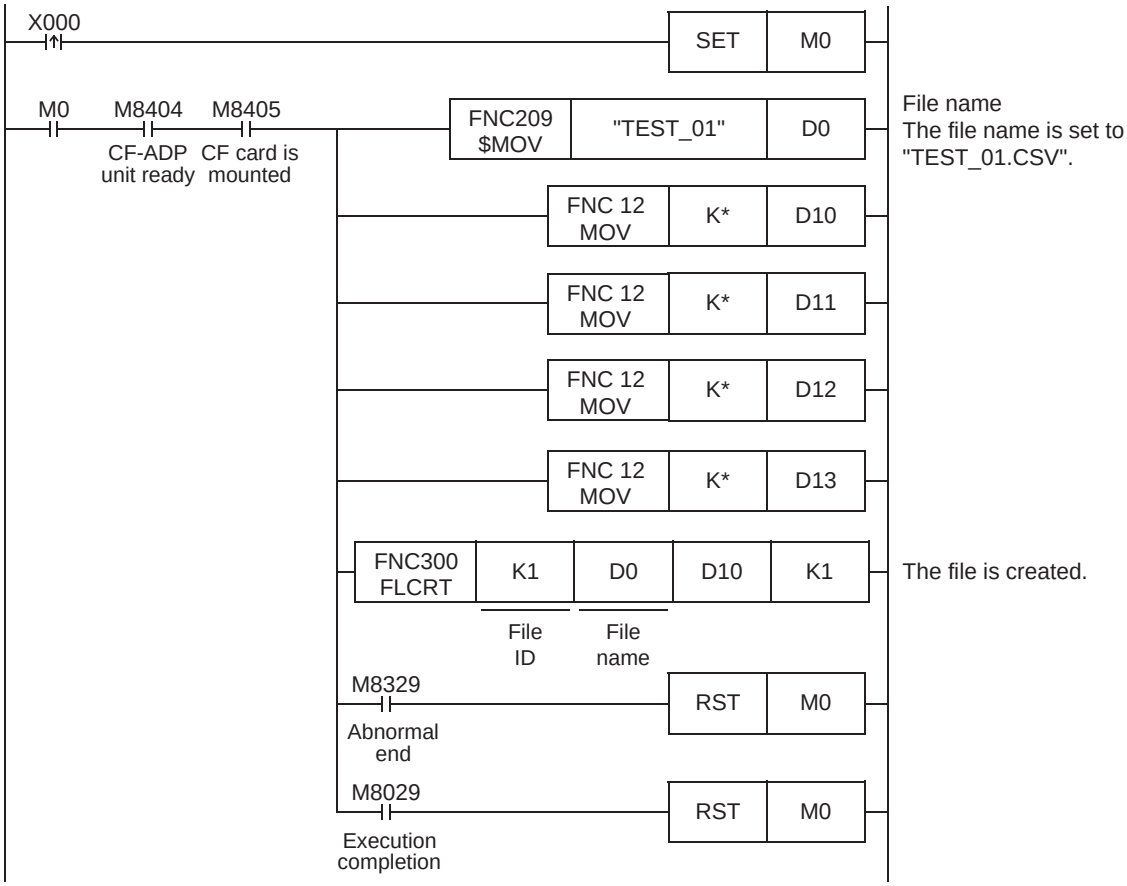
Times when data is written from the internal buffer inside the CF-ADP to the CompactFlash™ card

- When data to be buffered exceeds the capacity of the internal buffer inside the CF-ADP
- When the buffer force write command is executed
- When data writing is executed for a buffered file ID with the CompactFlash™ card specified as the writing destination
- When the CF card ACCESS switch is set from ON to OFF
- When an applied instruction to unmount the CompactFlash™ card is executed
- When the Index is returned to the head among buffered data (ring buffer)
  Or when data writing is executed for the specified maximum number of lines if "Stops execution" is selected as the processing to be executed when the maximum number of lines specified during file creation is reached
- When the overwrite applied instruction is executed while data is buffered

7.1.6 File ID

Applied instructions for the CF-ADP use the file ID for specifying files. Accordingly, the file name saved in the CompactFlash™ card is associated with the file ID, and controlled by the ID table.
When a file whose file ID is "1" and file name is "TEST_01.CSV" is created using the file creation program shown below, the file ID and file name are associated with each other as shown in "Example 1" in the ID table image. After each file is created, the user should use the file ID for specifying the file, instead of using the file name.

File creation program



ID table image

File ID	File neme
File ID=0	FILE****.CSV
File ID=1	TEST_01.CSV
File ID=2	********.CSV
• • •	• • •
File ID=61	********.CSV
File ID=62	********.CSV
File ID=63	********.CSV

Example 1

"****" represents a numeric value from 0000 to 0999. "FILE" in the file name is fixed.

The file ID "1" is associated with the file name "TEST_01.CSV".

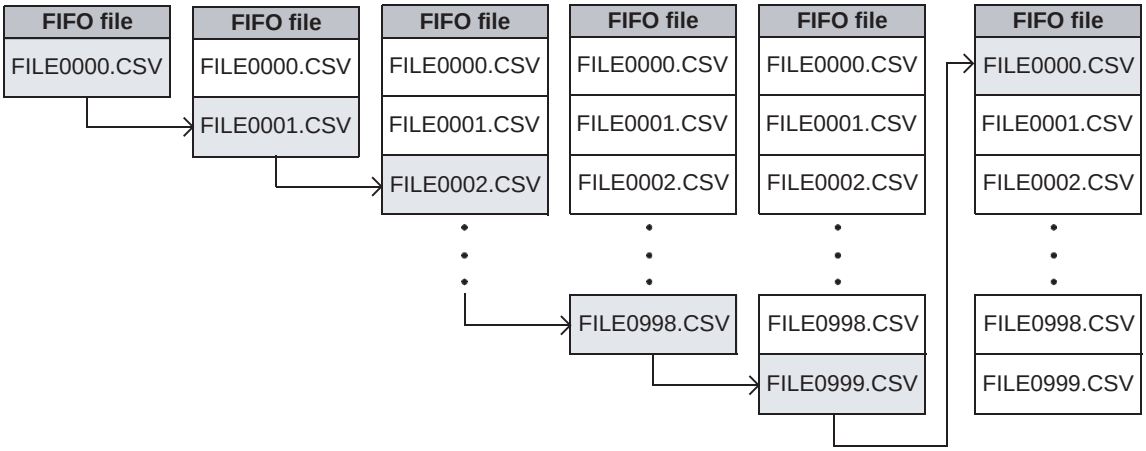
"********" represents the file name created by the user.

7.1.7 FIFO file

When the file ID is set to "K0", the CF-ADP creates FIFO files.
The CF-ADP creates multiple FIFO files, and executes FIFO (first in, first out) in units of files for the CF-ADP. With the FIFO function, the CF-ADP keeps the latest data, and deletes old data so that the total capacity of FIFO files and other files do not exceed the specified CompactFlash™ card use ratio.

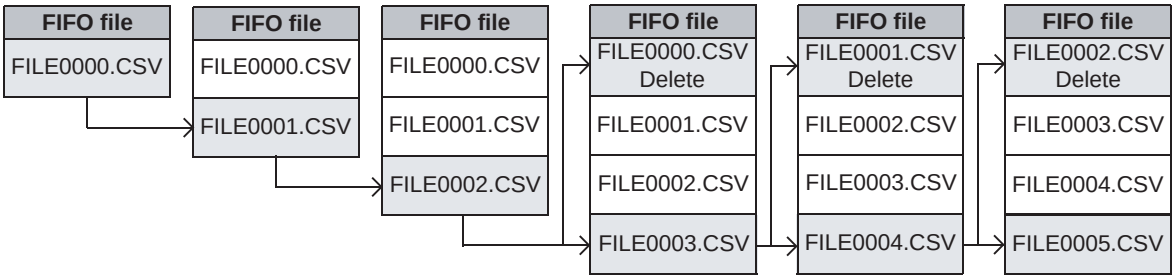
- When created files does not exceed the CompactFlash™ card capacity (specified CompactFlash™ card use ratio)
  The CF-ADP creates files whose name consists of a consecutive number in ascending order in the way "FILE0000.CSV, FILE0001.CSV ••• FILE0999.CSV". When the file name reaches "FILE0999.CSV", the CF-ADP deletes the oldest existing file "FILE0000.CSV", and creates a new file "FILE0000.CSV".

FIFO file creation



- When created files exceed the CompactFlash™ card capacity (specified CompactFlash™ card use ratio)
  The CF-ADP creates files whose name consists of a consecutive number in ascending order starting from "FILE0000.CSV" within the CompactFlash™ card capacity. When created files reach the CompactFlash™ card capacity, the CF-ADP deletes the oldest existing file, and creates a new file.

FIFO file creation



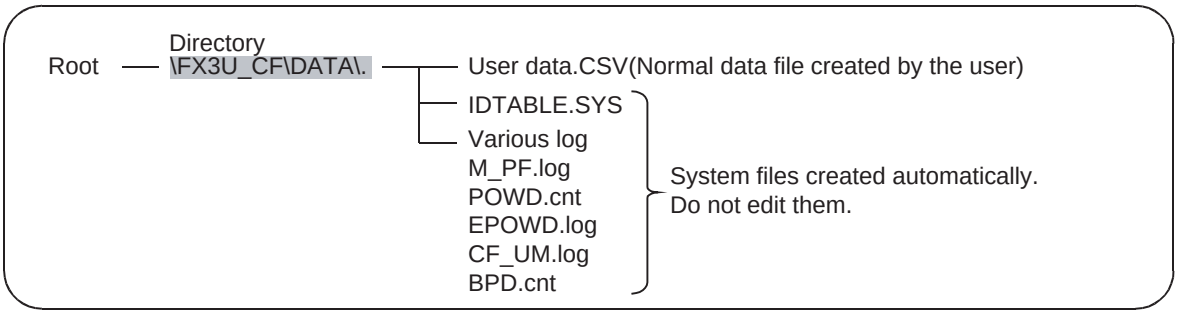
Caution

1) The CF-ADP can create up to 1000 files
   However, make sure that created files do not exceed the CompactFlash™ card capacity (specified CompactFlash™ card use ratio).
2) The file name is fixed to "FILE0000.CSV" to "FILE0999.CSV".

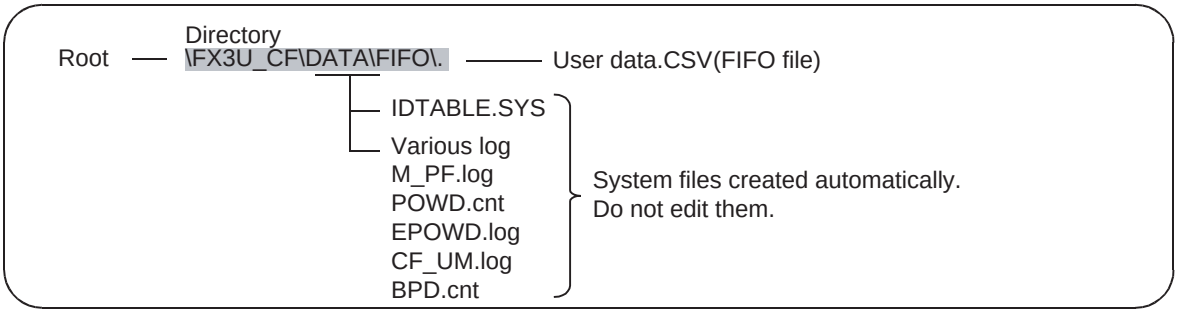
7.2 Directory structure

The following directory is created inside the CompactFlash™ card.

- In the case of a normal file
  The directory "\FX3U_CF\DATA\." is created inside the CompactFlash™ card.
  The following data is stored in the directory.



- In the case of a FIFO file
  The directory "\FX3U_CF\DATA\FIFO\." is created inside the CompactFlash™ card.
  The following data is stored in the directory.



7.3 Date/time setting

The clock function of the main unit is used for the date and time used in the CF-ADP.
Make sure to set the clock data in the main unit before using the CF-ADP.
The available clock data range is from "00:00:00 on January 1, 2008" to "23:59:59 on December 31, 2079".
If the user sets the date and time outside this range, "00:00:00 on January 1, 2008" is actually set instead.
For the clock data setting method in the main unit, refer to the following manual.

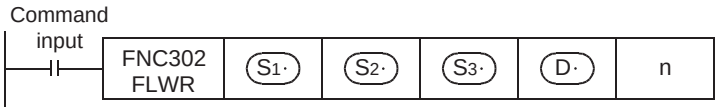
→ **Refer to the programming manual.**

7.4 General Rules for Applied Instructions

7.4.1 Expression and operation type of applied instructions

Instruction and operands

- Function numbers (FNC00 - FNC□□□) and symbols (mnemonic codes) are assigned to the applied instructions of the PLC. For example, a symbol of "FLWR" (Data write) is assigned to FNC302.
- Some applied instructions consist of the instruction area only, but many applied instructions consist of the instruction area and the operand.



(S) : An operand that will not be affected by the execution of the instruction is referred to as a source. This symbol represents a source.
If the operand device number can be modified by an index register, "•" will be added, and the S will be modified to (S•). If there are two or more sources, the modified sources will become (S1•), (S2•), and so on.

(D•) : An operand that will be affected by the execution of the instruction is referred to as a destination. This symbol represents a destination.
If the device numbers can be indexed by index registers, and if there are two or more destinations, the modified destinations will become (D1•), (D2•), and so on.

m, n : The operands not corresponding to source and destination are indicated as "m" and "n".
If the device number can be indexed by index registers, and if there are two or more operands, the modified operands will become m1·, m2·, n1·, n2·, and so on.

- Regarding program steps, the instruction area for each applied instruction is 1 step. The operand of each applied instruction, however, has 2 or 4 steps depending on the number of bits (16 or 32 bits).

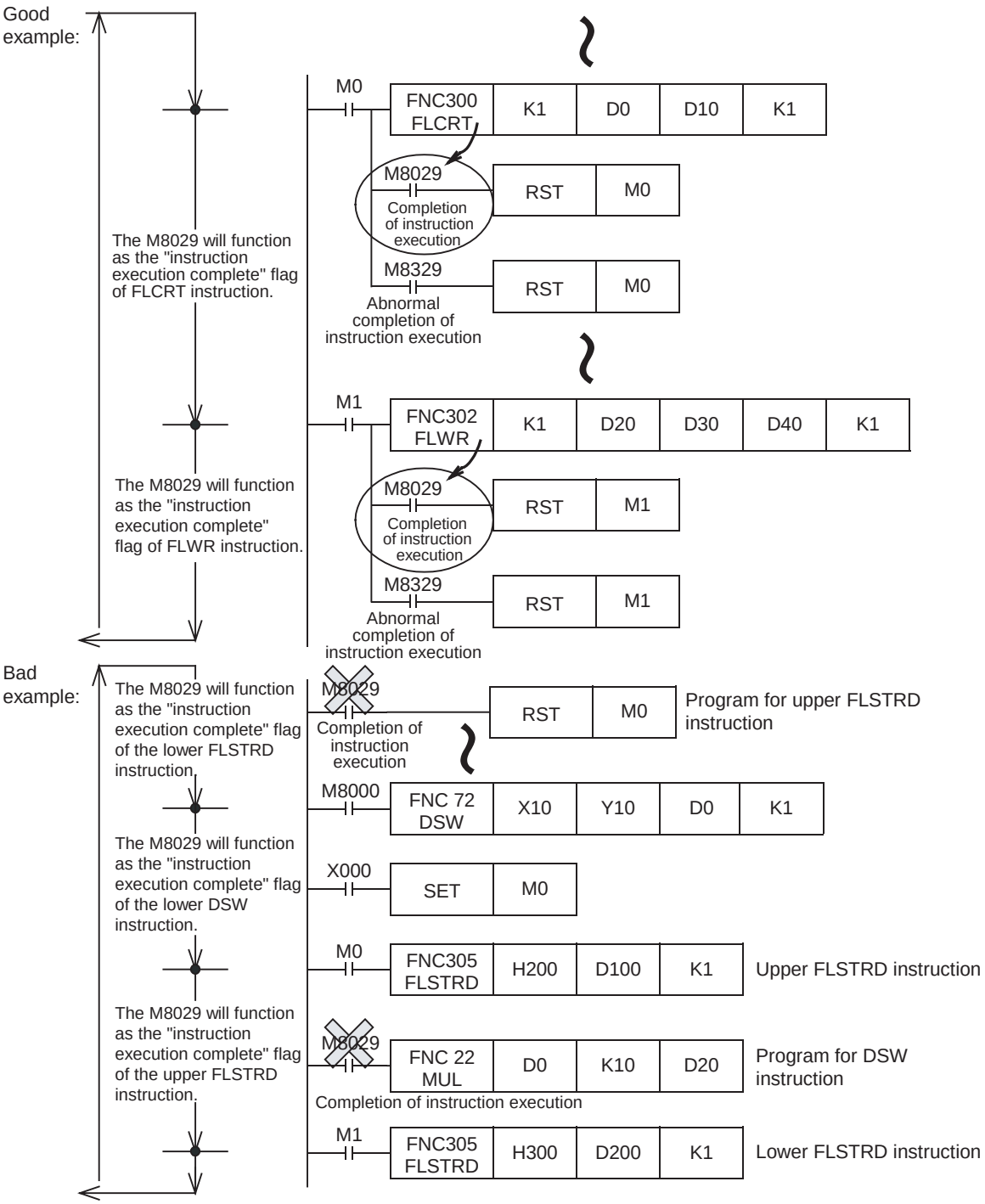
Devices for operands

- Bit devices X, Y, M, and S can be used for the operands, depending on the function.
- Combination of these bit devices, such as KnX, KnY, KnM, and KnS, can be used for numeric data.
→ **Refer to the programming manual.**
- Current value registers, such as data registers D, timers T, and counters C, can be used.
- A data register D consists of 16-bit. Two consecutive data registers (2 points) are used for 32-bit data. For example, if data register D0 is specified for the operand of a 32-bit instruction, D1 and D0 will be used for 32-bit data (D1 for the 16 high-order bits, and D0 for the 16 low-order bits).
If current value registers T and C are used as general data registers, they will behave the same way as data registers.
Each 32-bit counter (C200 to C255), however, can use 32-bit data without combining two counters. These counters, however, cannot be specified as the operands of 16-bit instructions.

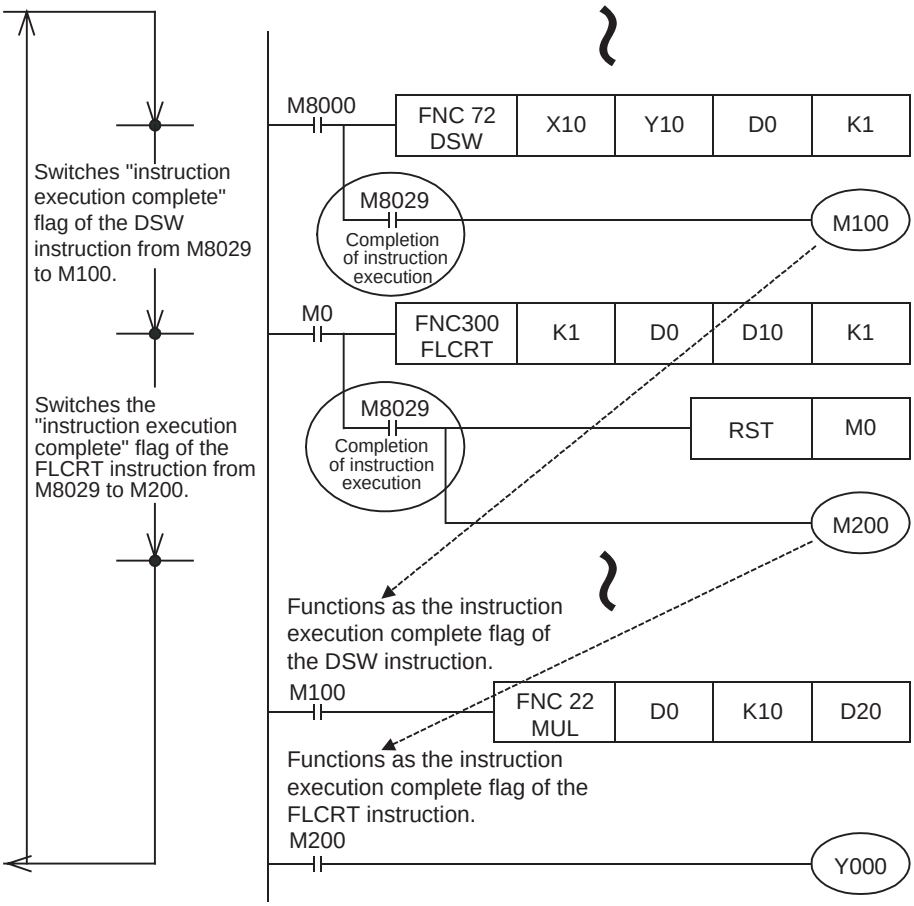
7.4.2 Programming using "Instruction execution complete" flag and "Instruction execution abnormal end" flag

1) If two or more CF-ADP instructions are used in a program, the "Instruction execution complete" flag (M8029)*1 or "Instruction execution abnormal end" flag (M8329) will be turned on or off after execution of each instruction. However, if the "Instruction execution complete" flag (M8029) and "Instruction execution abnormal end" flag (M8329) are used together for a program, it is difficult to determine which instruction turns them ON/OFF and the "Instruction execution complete" flag (M8029) will not be turned on for the intended instruction.

*1. For an applied instruction for the CF-ADP, the instruction execute complete flag (M8029) indicates that the instruction has been completed normally.
→ **To use a CF-ADP instructions at a position other than just below the instruction, refer to the example shown on the next page.**



2) To use at a position other than just below the CF-ADP instructions.
If two or more CF-ADP instructions are used in a program, the "Instruction execution complete" flag (M8029) and "Instruction execution abnormal end" flag (M8329) will be turned on or off after execution of each instruction.
If it is necessary to use the "Instruction execution complete" flag (M8029) or "Instruction execution abnormal end" flag (M8329) at a point other than just below the instruction, turn on or off another bit device just below the instruction, and use the contact as the command contact.



8. CF-ADP Applied Instructions Explanation

This chapter explains applied instructions for the CF-ADP.

8.1 CF-ADP Instructions types

The PLC and the CF-ADP transfer data to each other using applied instructions for the CF-ADP.
Six applied instructions are provided for purpose including file creation, data writing and data reading.

- List of applied instructions for the CF-ADP

FNC No.	instruction	Description	Control direction	Detailed explanation
300	FLCRT	File create / check	PLC→CF-ADP	Section 8.3
301	FLDEL	File delete / CF card format	PLC→CF-ADP	Section 8.4
302	FLWR	Data write	PLC→CF-ADP	Section 8.5
303	FLRD	Data read	PLC←CF-ADP	Section 8.6
304	FLCMD	FX3U-CF-ADP command	PLC→CF-ADP	Section 8.7
305	FLSTRD	FX3U-CF-ADP status read	PLC←CF-ADP	Section 8.8

8.2 Common Items in CF-ADP Instructions

8.2.1 Function and operation

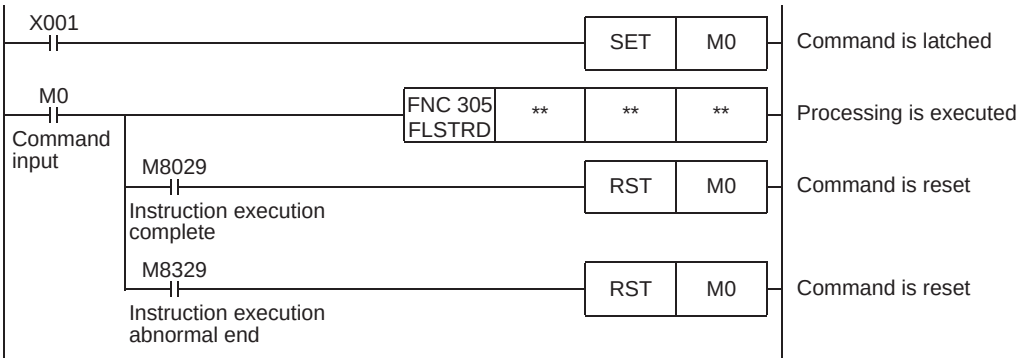
1. Processing start timing

When the command input turns from OFF to ON, the PLC starts processing for the CF-ADP.
If the command input turns OFF during processing for the CF-ADP, execution of the instruction is cancelled and the instruction is terminated abnormally.
If the command input remains ON, the PLC executes processing repeatedly.

2. Cautions on programming

For processing for the CF-ADP, keep ON the command input for an applied instruction for the CF-ADP ON until processing has been completed.
Make such a program that the command input is set to OFF using the instruction executing complete flag (M8029) after all processing for the CF-ADP are finished.

Program Example



3. Instruction execution complete flag (M8029)

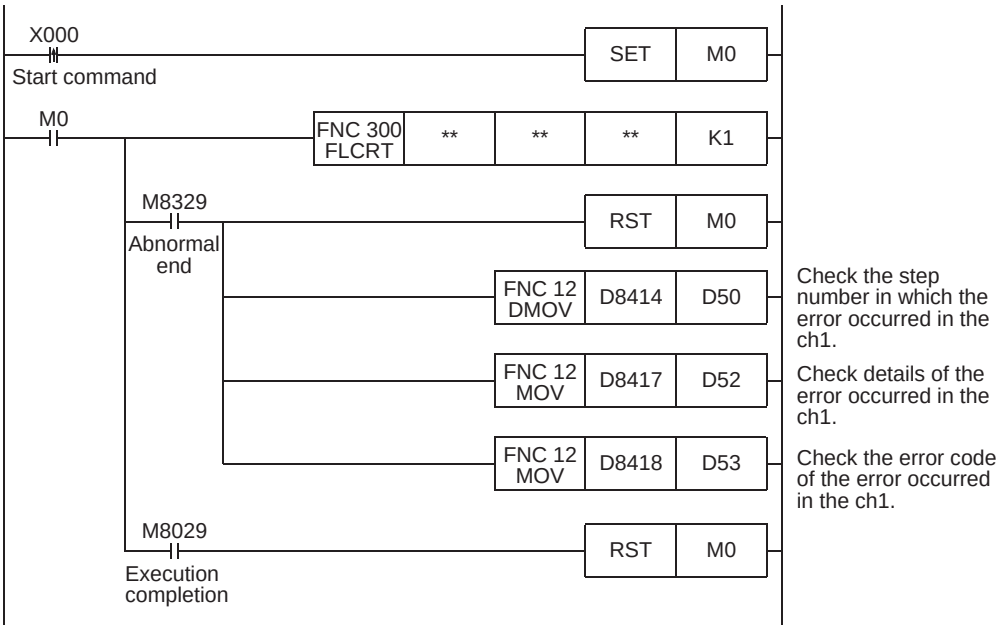
When processing for the CF-ADP has been completed normally, the instruction execute complete flag (M8029) turns ON, and remains ON for one scan.

4. Operation when an error occurrs

When an error occurs, the instruction execution abnormal complete flag (M8329) turns ON, and execution of the instruction is aborted.
After that, the error code is stored in the error code storage register, and the error flag turns ON.
The user can check the error code, error code details, and error detected step number using the following data registers.

Error code storange device		Error code detail storange device		Error detected step number storange device	
ch1	ch2	ch1	ch2	ch1	ch2
D8418	D8438	D8417	D8437	D8415,D8414	D8435,D8434

Program Example



8.2.2 Cautions on programming

1. Using a CF-ADP instruction together with another instruction

A CF-ADP instruction cannot be used together with a RS, RS2 instruction or inverter communication instructions if the RS2 instruction or inverter communication instructions uses the same channel.

2. Caution on when two or more application instructions for the CF-ADP are driven simultaneously

When two or more application instructions for the CF-ADP are driven simultaneously, after performing from the application command for the CF-ADP with the smaller step number in a program and completing instructions execution, the next application instructions for the CF-ADP is executed.

3. Caution on writing during RUN

CF-ADP instruction cannot be written to during RUN mode.
When the user writes an applied instruction for the CF-ADP during RUN mode, execution of the instruction is canceled.

4. Number of times data is written to the CompactFlash™ card

The number of times data is written to the CompactFlash™ card is limited.

When data is directly written to the CompactFlash™ card, data is written to the CompactFlash™ card every time the instruction is executed. The user should pay rigid attention to the number of times data is written to the CompactFlash™ card.

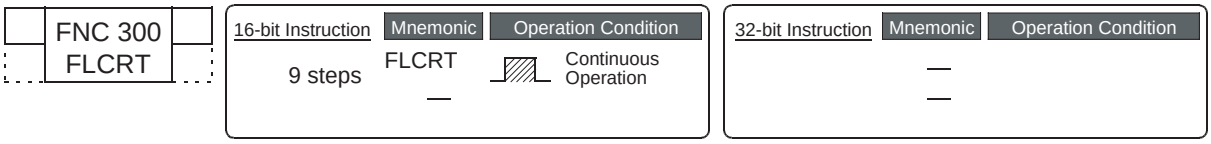
For example, if data is written to the CompactFlash™ card every one minute, data is written 100,000 times in approximately 2 months.

8.3 FNC 300 - FLCRT / File create•check

Outline

The FLCRT instruction creates a file inside the CompactFlash™ card mounted in the FX3U-CF-ADP. When executed after creation of a new file, the FLCRT instruction checks the association with the file ID, and evaluates it.

1. Instruction format



2. Set data

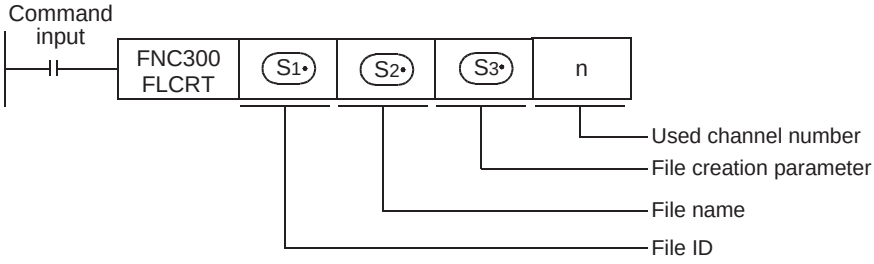
Operand Type	Description	Data Type
(S1•)	File ID (Refer to Subsection 8.3.1)	16-bit binary
(S2•)	File name (Refer to Subsection 8.3.1)	Character string
(S3•)	File creation parameter (Refer to Subsection 8.3.1)	16-bit binary
n	Used channel number [contents of setting : K1 = ch1, K2 = ch2]	16-bit binary

3. Applicable devices

Operand Type	Bit Devices							Word Devices												Others				
	System User							Digit Specification				System User				Special Unit	Index			Constant		Real Number	Character String	Pointer
	X	Y	M	T	C	S	D□.b	KnX	KnY	KnM	KnS	T	C	D	R	U□\G□	V	Z	Modify	K	H	E	"□"	P
(S1•)														✓	✓				✓	✓	✓			
(S2•)														✓	✓				✓				✓	
(S3•)														✓	✓				✓					
n																				✓	✓			

Explanation of function and operation

1. 16-bit operation (FLCRT)



- When the file ID is "K0"

When (S1•) is "K0", the FLCRT instruction creates a FIFO file.
When the PLC creates two or more files for FIFO file, and executes FIFO (first in, first out) in units of files.
The PLC keeps the latest file, and deletes older files so that the total capacity of FIFO files and other files does not exceed the specified capacity.

- When the file ID is "K1" to "K63"

When (S1•) is "K1" to "K63", the FLCRT instruction creates a file having the specified file name.
Sequence programs use the file ID for specifying a file. Accordingly, each file name saved in the CompactFlash™ card is associated with the file ID, and controlled by the file ID table.
If a file having the specified file name already exists and is registered in the file ID table, the PLC finishes the FLCRT instruction without executing any processing.
If a file having the specified name already exists but is not registered in the file ID table, the PLC only registers the existing file to the file ID table.

8.3.1 Detailed explanation of setting data

Details of the setting data in the FLCRT instruction are as shown below.

Setting items		Description	Data Type
	(S1•)	File ID This ID number is associated with the file name. The FLCRT instruction creates a file, and associates the file name with the file ID at the same time. The user should use the file ID for specifying a file after that. Allowable setting range : K0 to K63 ("K0" indicates "FIFO file".)	16-bit binary
	(S2•)	File name When (S1•) is "K0 (FIFO file)" Not used (ignored) Use an unused device. (D or R) When (S1•) is "K1" to "K63" Specify the file name in up to 8 characters until "null" or "null + null". Half-width alphanumeric characters and half-width symbols permitted in the MS-DOS are available. Half-width symbols : !, #, $, %, &, ', (,), +, -, @, ^, _, ', [,], ~ The extension is fixed to "CSV"	Character string
File creation parameter	(S3•)	Time stamp setting Set whether or not the time stamp is added to the file. Specify the format when adding the time stamp. K0 : None (NULL) K1 : yyyy/mm/dd hh:mm:ss K2 : yy/mm/dd hh:mm:ss K3 : dd/mm/yyyy hh:mm:ss K4 : dd/mm/yy hh:mm:ss K5 : mm/dd/yyyy hh:mm:ss K6 : mm/dd/yy hh:mm:ss K7 : hh:mm:ss	16-bit binary
	(S3•) +1	Data type Set the data type to be saved. K0 : No data type specification (mixed type) K1 : Bit type K2 : Decimal type (16-bit) K3 : Decimal type (32-bit) K4 : Hexadecimal type (16-bit) K5 : Hexadecimal type (32-bit) K6 : Real numbers(Floating point data) Exponent expression type K7 : Character string	16-bit binary
	(S3•) +2	Maximum number of lines Set the maximum number of lines. Allowable setting range : K1 to K32767*1	16-bit binary
	(S3•) +3	When (S1•) is "K0" Set the CompactFlash™ card use ratio. Specify the ratio (%) out of the whole CompactFlash™ card capacity to be used. Allowable setting range : 10 to 90 (%)	16-bit binary
		When (S1•) is "K1" to "K63" File processing to be executed when the specified maximum number of lines is reached. Set the file processing method to be executed when the number of lines reaches the specified maximum value. K0 : Stops execution. (The line position remains at the specified maximum line position.) K1 : Returns to the head (ring buffer file).	16-bit binary
	n	Channel number used by the CF-ADP K1 : ch1 K2 : ch2	16-bit binary

*1. Adjust the maximum number of lines to specify the file size available in the used application software used.
For the file size calculation formula, refer to Subsection 7.1.4.

Caution

When the file ID is "K0"

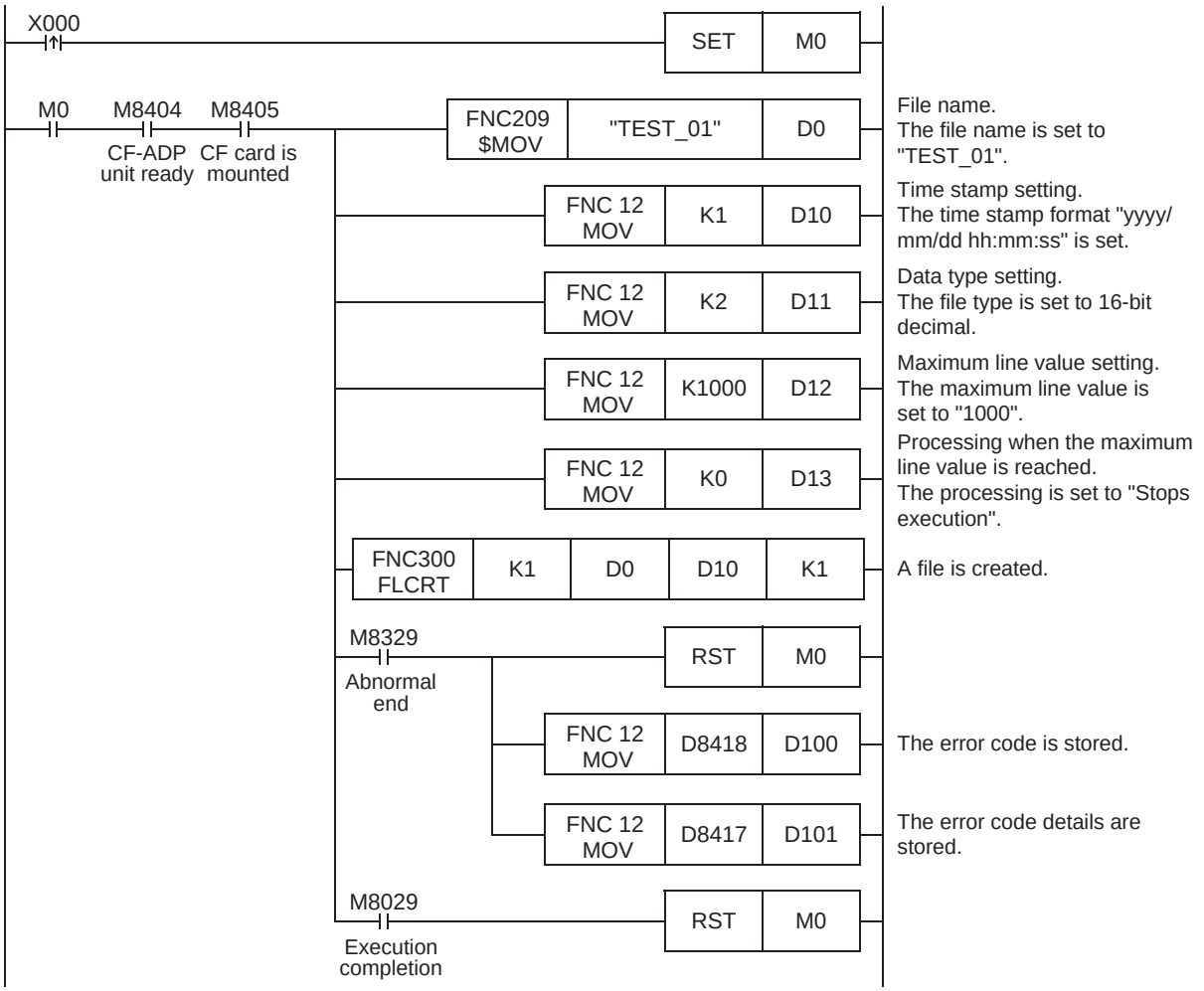
1) The CF-ADP can create up to 1000 files (within the CompactFlash™ card capacity).
2) The file name is set to "FILE0000.CSV" to "FILE0999.CSV".

When the file ID is "K1" to "K63"

1) The user can create up to 63 files (within the CompactFlash™ card capacity).
2) The FLCRT instruction is completed abnormally if different file names are specified for the same file ID or if the same file name is specified for different file IDs.

Program Example

This program creates a file whose ID is "1" and file name is "TEST_01" when X000 turns ON.
The time stamp setting, data type, maximum Index value, and processing when the maximum Index value is reached are as shown below.
The channel number 1 is used.

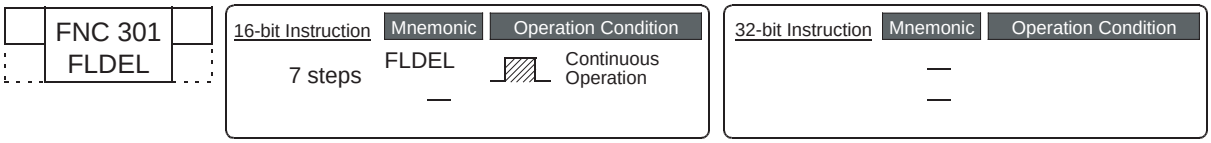


8.4 FNC 301 - FLDEL / File delete•CF card format

Outline

The FLDEL instruction deletes files stored in the CompactFlash™ card, or formats the CompactFlash™ card.

1. Instruction format



2. Set data

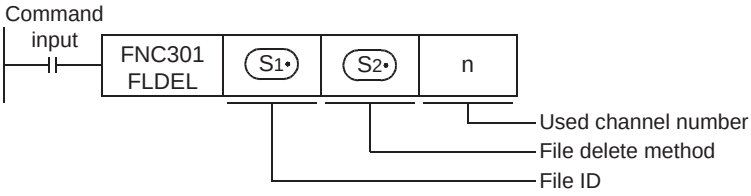
Operand Type	Description	Data Type
(S1•)	File ID (Refer to Subsection 8.4.1)	16-bit binary
(S2•)	File delete method (Refer to Subsection 8.4.1)	16-bit binary
n	Used channel number [contents of setting : K1 = ch1, K2 = ch2]	16-bit binary

3. Applicable devices

Operand Type	Bit Devices							Word Devices												Others				
	System User						Digit Specification				System User				Special Unit	Index			Con-stant		Real Number	Charac-ter String	Pointer
	X	Y	M	T	C	S	D□.b	KnX	KnY	KnM	KnS	T	C	D	R	U□\G□	V	Z	Modify	K	H	E	"□"	P
(S1•)														✓	✓				✓	✓	✓			
(S2•)														✓	✓				✓	✓	✓			
n																				✓	✓			

Explanation of function and operation

1. 16-bit operation (FLDEL)



The FLDEL instruction deletes files stored in the CompactFlash™ card, or formats the CompactFlash™ card in the following method.

- Specify file deletion or file formatting using (S1•).
  - When (S1•) is "K-1 (H0FFFF)", the FLDEL instruction deletes all files whose ID is 0 to 63.
  - When (S1•) is "K0" to "K63", the FLDEL instruction deletes the file associated with the specified file ID.
  - When (S1•) is "K512 (H200)", the FLDEL instruction formats the CompactFlash™ card.
- Specify the file deletion method or format type using (S2•).
  - When (S1•) is "K-1 (H0FFFF)" or "K0" to "K63", specify the deletion method
    K0: The FLDEL instruction deletes the specified file.
    K1: The FLDEL instruction deletes the association between the file name and the file ID (, but does not delete the file itself).

    However, when the file ID specified in (S1•) is "0", the FLDEL instruction deletes the file without regard to the setting of (S2•).
  - When (S1•) is "K512 (H200)", specify the format type.
    k256(H100) : The FLDEL instruction formats the CompactFlash™ card in FAT16 format.

For details, refer to Subsection 8.4.1.

8.4.1 Detailed explanation of setting data

Details of the setting data in the FLDEL instruction are as shown below.

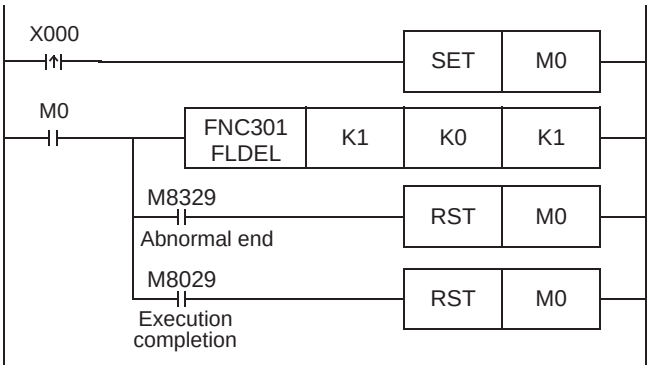
Setting items	Description	Data Type
(S1•)	File ID K-1(H0FFFF) : The FLDEL instruction deletes all files. K0 to K63 : The FLDEL instruction deletes a file associated with the specified file ID. K512(H200) : The FLDEL instruction formats the CompactFlash™ card.	16-bit binary
(S2•)	When (S1•) is "K-1 (H0FFFF)" or "K0" to "K63" Specify the deletion method. K0 : The FLDEL instruction deletes the specified file. K1 : The FLDEL instruction deletes the association between the file name and the file ID (but does not delete the file itself). However, when the file ID specified in (S1•) is "0", the FLDEL instruction deletes the file itself without regard to the setting of (S2•) .	16-bit binary
	When (S1•) is "K512 (H200)" Specify the format type. K256(H100) : The FLDEL instruction formats the CompactFlash™ card in the FAT16 format.	
n	Channel number used by the CF-ADP K1 : ch1 K2 : ch2	16-bit binary

Cautions

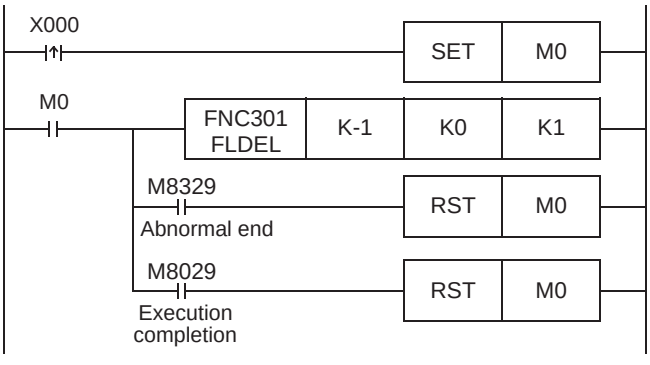
When the file ID "K0 (FIFO file)" or "K-1 (all files)" is specified, it may take approximately 1 minute to delete the files depending on the number of stored files.

Program Example

1) Program Example 1
This program deletes the file whose ID is "1" when X000 turns ON.
Channel number 1 is used.

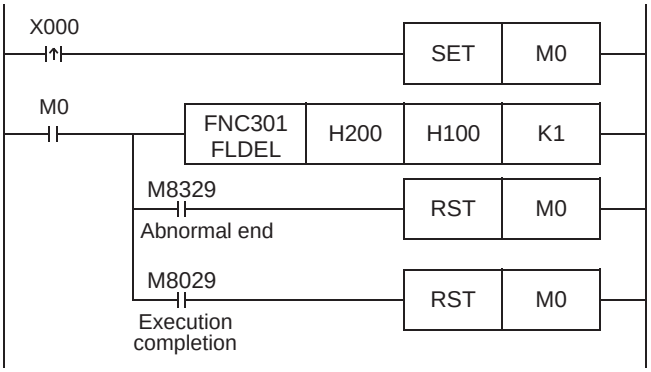


2) Program Example 2
This program deletes all files when X000 turns ON.
Channel number 1 is used.



3) Program Example 3

This program formats the CompactFlash™ card in the FAT 16 format when X000 turns ON. Channel number 1 is used.

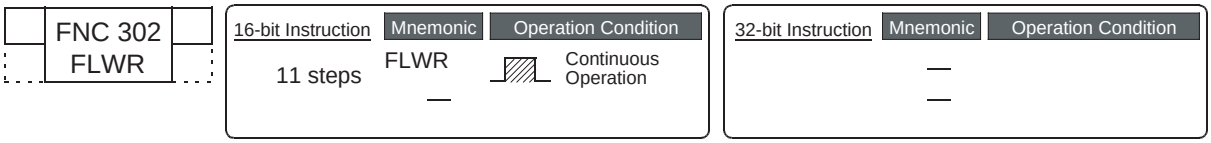


8.5 FNC 302 - FLWR / Data write

Outline

The FLWR instruction writes data to the CompactFlash™ card or to the buffer inside the FX3U-CF-ADP.

1. Instruction format



2. Set data

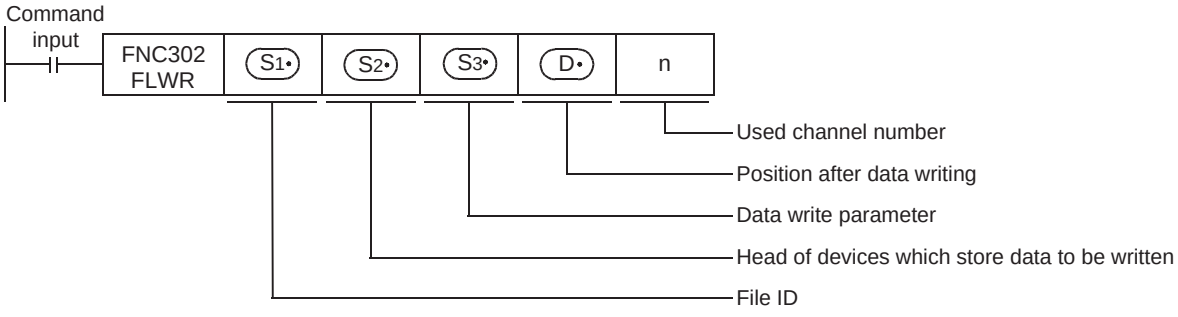
Operand Type	Description	Data Type
(S1•)	File ID (Refer to Subsection 8.5.1)	16-bit binary
(S2•)	Head of devices which store data to be written (Refer to Subsection 8.5.1)	-
(S3•)	Data write parameter (Refer to Subsection 8.5.1)	16-bit binary
(D•)	Position after data writing (Refer to Subsection 8.5.1)	16-bit binary
n	Used channel number [contents of setting : K1 = ch1, K2 = ch2]	16-bit binary

3. Applicable devices

Operand Type	Bit Devices							Word Devices												Others				
	System User							Digit Specification				System User				Special Unit	Index			Con-stant		Real Number	Charac-ter String	Pointer
	X	Y	M	T	C	S	D□.b	KnX	KnY	KnM	KnS	T	C	D	R	U□\G□	V	Z	Modify	K	H	E	"□"	P
(S1•)														✓	✓				✓	✓	✓			
(S2•)	✓	✓	✓			✓						✓	✓	✓	✓				✓					
(S3•)														✓	✓				✓					
(D•)														✓	✓				✓					
n																				✓	✓			

Explanation of function and operation

1. 16-bit operation (FLWR)



The FLWR instruction writes data specified by the device (S2•) to a file stored in the CompactFlash™ card specified by the file ID or to the buffer inside the CF-ADP. The FLWR instruction can overwrite data in the line position specified by the device (S3•) +1, and can write additional data (K-1). When the writing destination is the buffer inside the CF-ADP, the FLWR instruction can only execute additional writing. When writing is completed, the line position and column position after writing are as follows.

- When data in 1 line is written additionally
  - Line position after writing : Written line position + K1
  - Column position after writing : K1
- When a line having existing data is overwritten
  - Line position after writing :
    Written line position if data is not written to the final column position of the specified line position
    Line position next to the written line position if data is written to the final column position of the line
  - Column position after writing:
    Column position next to the final written data point K1 if data is written to the final data point in the line
    "K1" if data is written to the final data point in the line

Both additional writing and overwriting are executed to the maximum number of lines specified during file creation. If data is written up to the final column position, the line position after writing varies depending on the file type and setting.

- When the processing is stopped by the maximum line position in a normal file
  Line position value after writing = Maximum line position + K1
  K-32768 when the maximum line position is "K32767"
- In the case of a normal file in which processing returns to the head of the file from the end of the file (ring buffer file)
  Line position after writing = K1
- In the case of FIFO file
  Line position after writing = K1

In either case, the column position after writing is "K1".

8.5.1 Detailed explanation of setting data

Details of the setting data in the FLWR instruction are as shown below.

Setting items		Description	Data Type
(S1•)		File ID K0 to K63	16-bit binary
(S2•)		Head of devices which store data to be written. Specify the head of devices which store the data to be written to the CompactFlash™ card.	-
Data write parameter	(S3•)	Specify the data writing type K0 : Mixed type K1 : Bit type K2 : Decimal type (16-bit) K3 : Decimal type (32-bit) K4 : Hexadecimal type (16-bit) K5 : Hexadecimal type (32-bit) K6 : Real numbers(Floating point data) Exponent expression type (32-bit) K7 : Character string (512 half-width/full-width characters maximum) K8 : Data name :Character string consisting of up to 32 half-width/full-width characters. Index, DATE TIME are added automatically.	16-bit binary
	(S3•) +1	Specify the line position of the writing destination, or specify additional writing. Line position of the writing destination : K1 to specified maximum number of lines Additional writing : K-1	16-bit binary
	(S3•) +2	Specify the data column position in the writing destination. Column position : K1 to K254 Additional writing : K-1	16-bit binary
	(S3•) +3	Number of written data points K1 to K254	16-bit binary
	(S3•) +4	Writing destination K0 : CompactFlash™ card K1 : Buffer inside the CF-ADP	16-bit binary
(D•)		Line position after writing K1 to specified maximum number of lines	16-bit binary
(D•) +1		Column position after writing K1 to K254	16-bit binary
n		Channel number used by the CF-ADP K1 : ch1 K2 : ch2	16-bit binary

Cautions

1) The FLWR instruction is completed abnormally if a CompactFlash™ card is not mounted.
2) The user should pay close attention to the number of times data is written when the writing destination is set to the CompactFlash™ card because data is written every time the FLWR instruction is executed.
   For example, if data is written to the CompactFlash™ card every one minute, data is written 100,000 times in approximately 2 months.
3) Even if the writing destination is set to the buffer inside the CF-ADP, data is written to the CompactFlash™ card in the case of overwriting.
4) The FLWR instruction writes data to the CompactFlash™ card after the internal buffer inside the CF-ADP becomes full when the writing destination is set to the buffer. Data stored in the internal buffer inside the CF-ADP is erased when a (instantaneous or long) power interruption occurs.
5) When the data type is a data name (K8), the user can specify only the head line before writing other data. Index and DATE TIME are added automatically.
6) The FLWR instruction may require several scans to acquire data. Take proper measures such as saving acquired data in another device if data consistency is required.
7) It is necessary to set the device number in multiples of 16 when a bit device is specified in (S2•) and the data type is set to anything other than bit type. When a word device is specified in (S2•) and the data type is set to bit, the FLWR instruction acquires data to be written from the least significant bit of the specified device.
8) When (S3•) is "K7" or "K8", 00H, which indicates the end of the string, must be added to the end of the character string.

8.5.2 Writing data of same type

"m" data points of the same type in one line are written as follows.
Additional writing or overwriting is available.

	Instruction name	File ID (S1·)	Source data (S2·)	Data write parameter (S3·)	Line position after writing (D·)	Used channel number n
Command input	FLWR	K*	S2· ... S2·+m-1	S3· K**** Data type specification	D· Line position	n
				S3·+1 K**** or K-1 Line position	D·+1 Column position	
				S3·+2 K**** Column position		
				S3·+3 K(m) Points		
				S3·+4 K* Writing destination		

1. When writing additional data to a file

- Set the data writing parameters (line position and column position) as follows.
  - Line position of writing destination : K-1 (Additional writing)
  - Column position : K1 (Head)
- When executed once, the FLWR instruction adds data by 1 line. It is not possible to additionally write data which increases columns in to a previously written line position.
- The time stamp is added at the time of writing if the addition of the time stamp when writing has been set.
- After writing, the line position stores the following value
  - Line position after writing : Line position next to the written line position
  - Column position after writing : K1

Program Example

- Explanation of operation

When X000 turns ON, the decimal (16-bit) data stored in D10 to D14 is written additionally to the 3rd line (Index 3) in the following file. The writing destination is the CompactFlash™ card. D0 stores the line position after writing, and D1 stores the column position after writing.
Channel 1 is used in this program. For details on sequence programs, refer to next page.

- Content of file

File ID=K10, The data name is already written.

Before the FLWR instruction is executed

Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	111	222	333	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	1111	2222	3333	-44	5	(CR)(LF)

After the FLWR instruction is executed

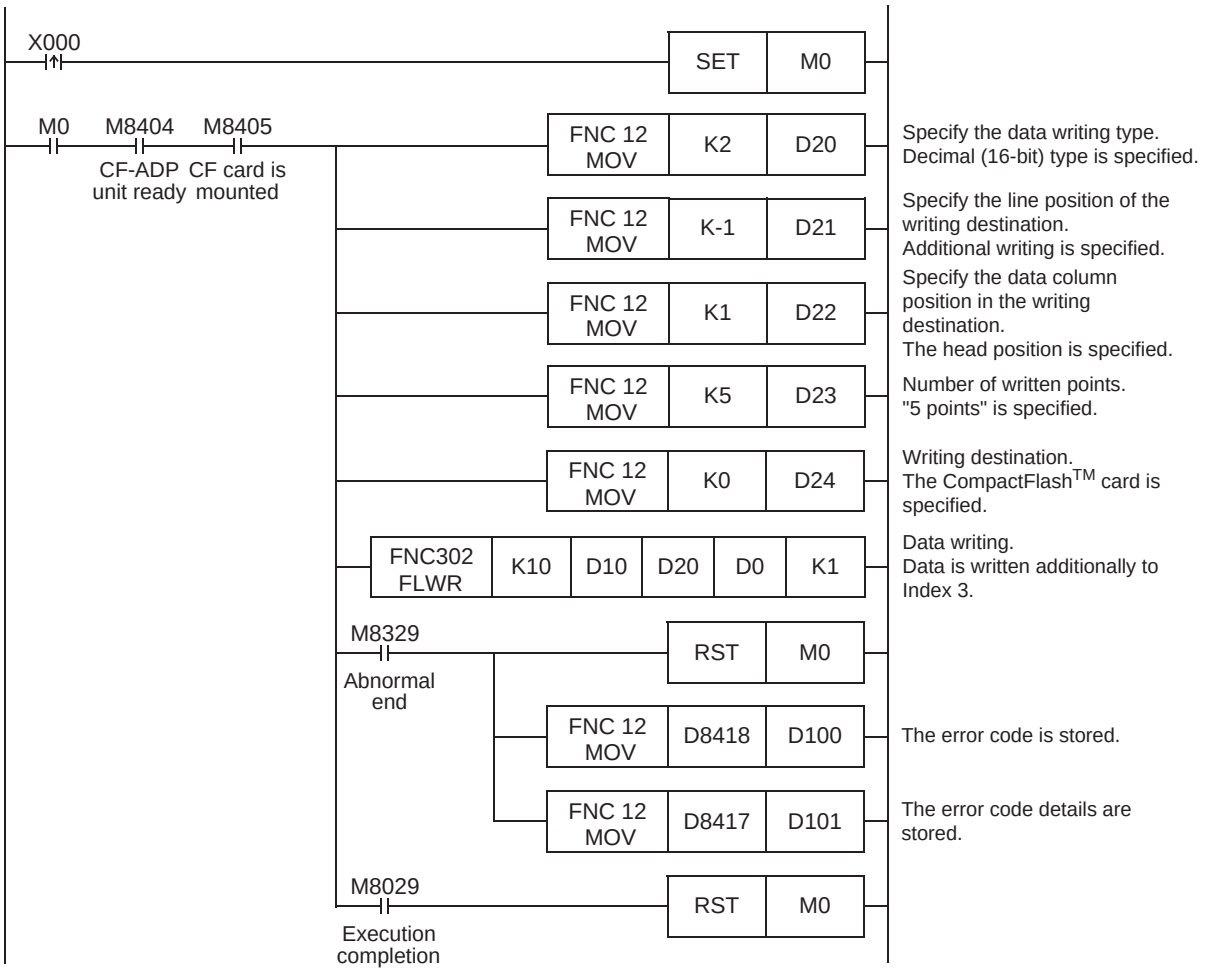
Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	111	222	333	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	1111	2222	3333	-44	5	(CR)(LF)
3	2009/ 9/10 23:59:00 The time at which the instruction is executed is added.	11 The value of D10 is written additionally	22 The value of D11 is written additionally	33 The value of D12 is written additionally	-4444 The value of D13 is written additionally	55 The value of D14 is written additionally	(CR)(LF)

Line position after data is written by the FLWR instruction

Line position after writing : D0=K4
Column position after writing : D1=K1

• Sequence program

It is assumed that D10 to D14 store values.
This program does not describe such values.



2. When overwriting data in a previously written line

- Set the data writing parameters (line position and column position of the writing destination) in accordance with the written points.
- Only data the same type as the original data can be used for overwriting. When the data type is a character string, only a character string not longer than the original character string can be used for overwriting.
- It is not possible to write data additionally after the final data point of a previously written line.
- The time stamp is updated at the time of overwriting.
- The line position after writing is the specified line position. The column position after writing is the column position next to the final written data. However, if data is written up to the end of a line, the line position after writing is the line position next to the written line position, and the column position after writing is "K1".

Program Example

- Explanation of operation

When X000 turns ON, the decimal (16-bit) data stored in D10 and D11 overwrites the Index 2 in the following file. The writing destination is the CompactFlash™ card. D0 stores the line position after writing, and D1 stores the column position after writing.
Channel 1 is used in this program. For details on sequence programs, refer to next page.

- Content of file

File ID=K10, The data name is already written.

Before the FLWR instruction is executed

Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	111	222	333	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	1111	2222	3333	-44	5	(CR)(LF)
3	2009/ 9/ 9 23:59:04	111	22	33	-4444	55	(CR)(LF)

After the FLWR instruction is executed

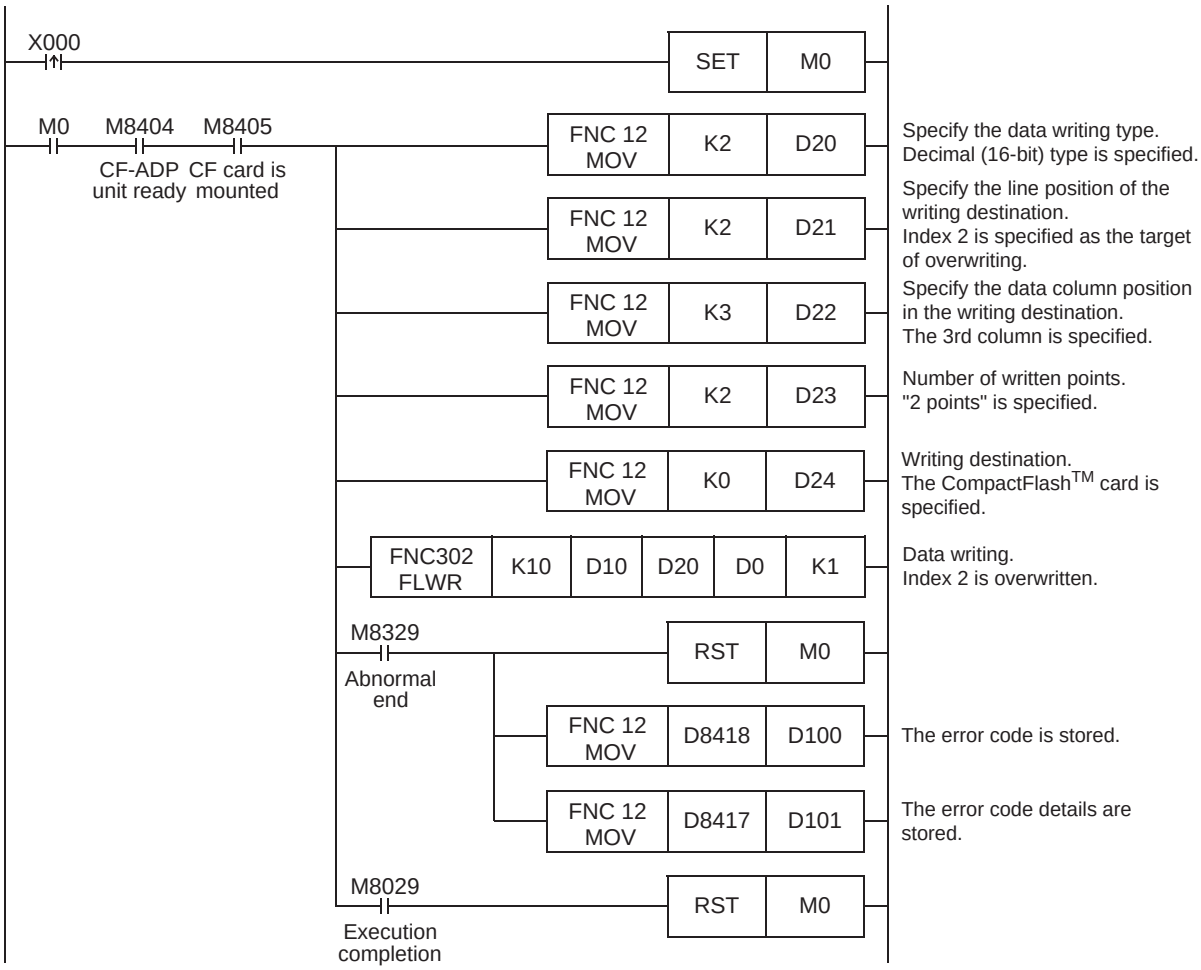
Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	111	222	333	-444	555	(CR)(LF)
2	2009/ 9/10 23:59:30 The time stamp is updated at the time of overwriting.	1111	2222	1234 The existing data is overwritten by the value stored in D10.	2345 The existing data is overwritten by the value stored in D11.	5	(CR)(LF)
3	2009/ 9/ 9 23:59:04	111	22	33	-4444	55	(CR)(LF)

Line position after data is written by the FLWR instruction

Line position after writing : D0=K2
Column position after writing : D1=K5

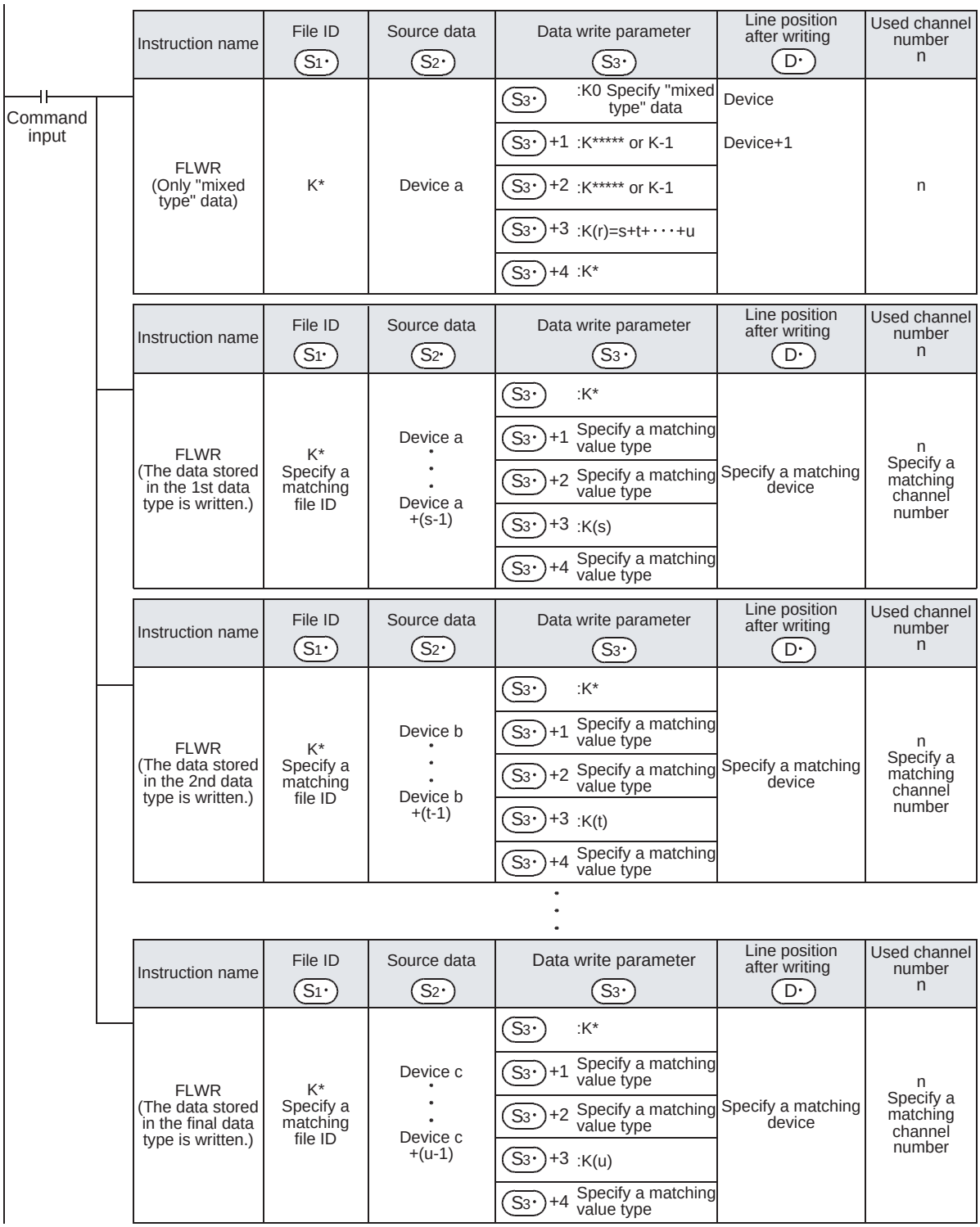
• Sequence program

It is assumed that D10 and D11 store values.
This program does not describe such values.



8.5.3 Writing data of different types

Data of different types existing in 1 line are written as follows.
Additional writing or overwriting is available.



Instruction name	File ID (S1・)	Source data (S2・)	Data write parameter (S3・)	Line position after writing (D・)	Used channel number n
FLWR (Only "mixed type" data)	K*	Device a	(S3・) :K0 Specify "mixed type" data	Device	n
			(S3・)+1 :K***** or K-1	Device+1	
			(S3・)+2 :K***** or K-1		
			(S3・)+3 :K(r)=s+t+・・・+u		
			(S3・)+4 :K*		

Instruction name	File ID (S1・)	Source data (S2・)	Data write parameter (S3・)	Line position after writing (D・)	Used channel number n
FLWR (The data stored in the 1st data type is written.)	K* Specify a matching file ID	Device a ・ ・ ・ Device a +(s-1)	(S3・) :K*	Specify a matching device	n Specify a matching channel number
			(S3・)+1 Specify a matching value type		
			(S3・)+2 Specify a matching value type		
			(S3・)+3 :K(s)		
			(S3・)+4 Specify a matching value type		

Instruction name	File ID (S1・)	Source data (S2・)	Data write parameter (S3・)	Line position after writing (D・)	Used channel number n
FLWR (The data stored in the 2nd data type is written.)	K* Specify a matching file ID	Device b ・ ・ ・ Device b +(t-1)	(S3・) :K*	Specify a matching device	n Specify a matching channel number
			(S3・)+1 Specify a matching value type		
			(S3・)+2 Specify a matching value type		
			(S3・)+3 :K(t)		
			(S3・)+4 Specify a matching value type		

・
・
・

Instruction name	File ID (S1・)	Source data (S2・)	Data write parameter (S3・)	Line position after writing (D・)	Used channel number n
FLWR (The data stored in the final data type is written.)	K* Specify a matching file ID	Device c ・ ・ ・ Device c +(u-1)	(S3・) :K*	Specify a matching device	n Specify a matching channel number
			(S3・)+1 Specify a matching value type		
			(S3・)+2 Specify a matching value type		
			(S3・)+3 :K(u)		
			(S3・)+4 Specify a matching value type		

Cautions

1) Do not use another applied instruction for the CF-ADP in between a series of FLWR instructions. Set a common driving condition among a series of FLWR instructions.
2) Set matching values to the file ID and writing destination line position.
3) Make sure that the total number of devices in one line is 254 or less. (s+t+•••u $<$ 254)
4) Use values after completion of a series of FLWR instructions for the line position after writing and column position after writing.

1. When writing additional data to a file

- Set the data writing parameters as follows in all of a series of FLWR instructions.
  - Line position of writing destination : K-1 (Additional writing)
  - Column position : K-1
- A series of FLWR instructions is executed, and data in one line is added.
  It is not possible to write the same line data additionally to a previously written line.
- The time stamp is added at the time of writing if addition of the time stamp is set.
- The line position after writing is as follows.
  - Line position after writing : Line position next to the written line
  - Column position after writing : K1
- In a series of FLWR instructions, the user can specify a matching device in (S3•) in all FLWR instructions, or specify different devices. When specifying a matching device, it is necessary to change the type (S3•) and number of points (S3•) +3 among FLWR instructions in accordance with each transferred data point using the MOV instruction, etc. (At this time, do not use a pulse type instruction.)

Program Example

- Explanation of operation

When X000 turns ON, the data stored in D101 and D100 (32-bit hexadecimal type), data stored in Y010 (bit type), data stored in Y011 (bit type), data stored in R100 (16-bit decimal type), and data stored in R101 (16-bit decimal type) are written respectively to Index 3 additionally in the following file. The writing destination is the CompactFlash™ card. D20 stores the line position after writing, and D21 stores the column position after writing.
Channel 2 is used in this program. For details on sequence programs, refer to next page.

- Content of file

File ID=K5, The data name is already written.

Before the FLWR instruction is executed

Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	12AB2222	1	0	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	12AB3333	0	1	-44	5	(CR)(LF)

After the FLWR instruction is executed

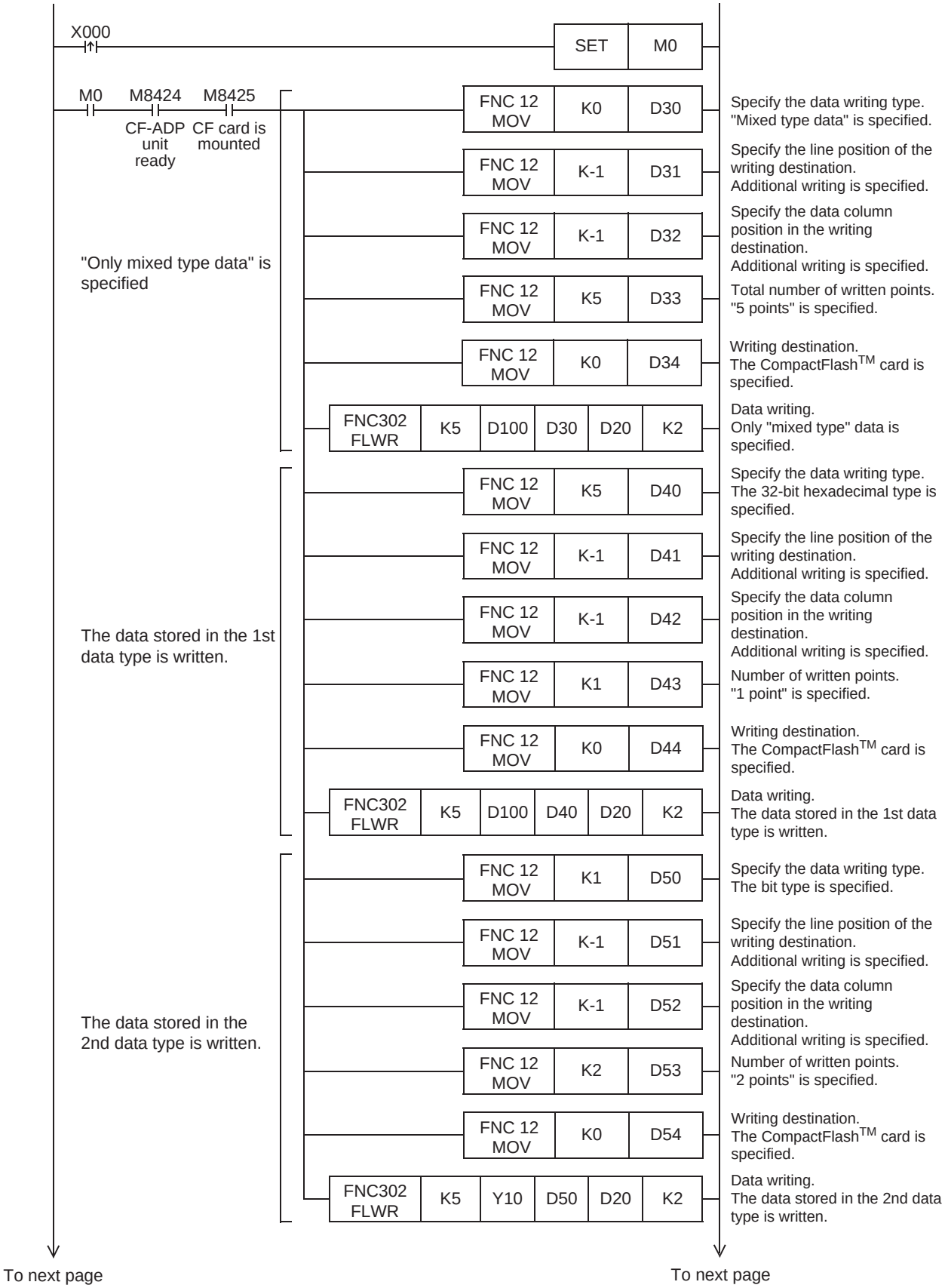
Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	12AB2222	1	0	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	12AB3333	0	1	-44	5	(CR)(LF)
3	2009/ 9/10 23:59:00 The time at which the instruction is executed is added.	23CDFFFF The value of D101, D100 is written additionally.	1 Y010 (ON = 1) is written additionally.	1 Y011 (ON = 1) is written additionally.	-4444 The value of R100 is written additionally.	55 The value of R101 is written additionally.	(CR)(LF)

Line position after data is written by the FLWR instruction

Line position after writing : D20=K4
Column position after writing : D21=K1

- Sequence program

It is assumed that D101 and D100 store 32-bit hexadecimal data, Y010 stores bit data, Y011 stores bit data, R100 stores 16-bit decimal data, and R101 stores 16-bit decimal data respectively.
This program does not describe such values.



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8 CF-ADP Applied Instructions Explanation
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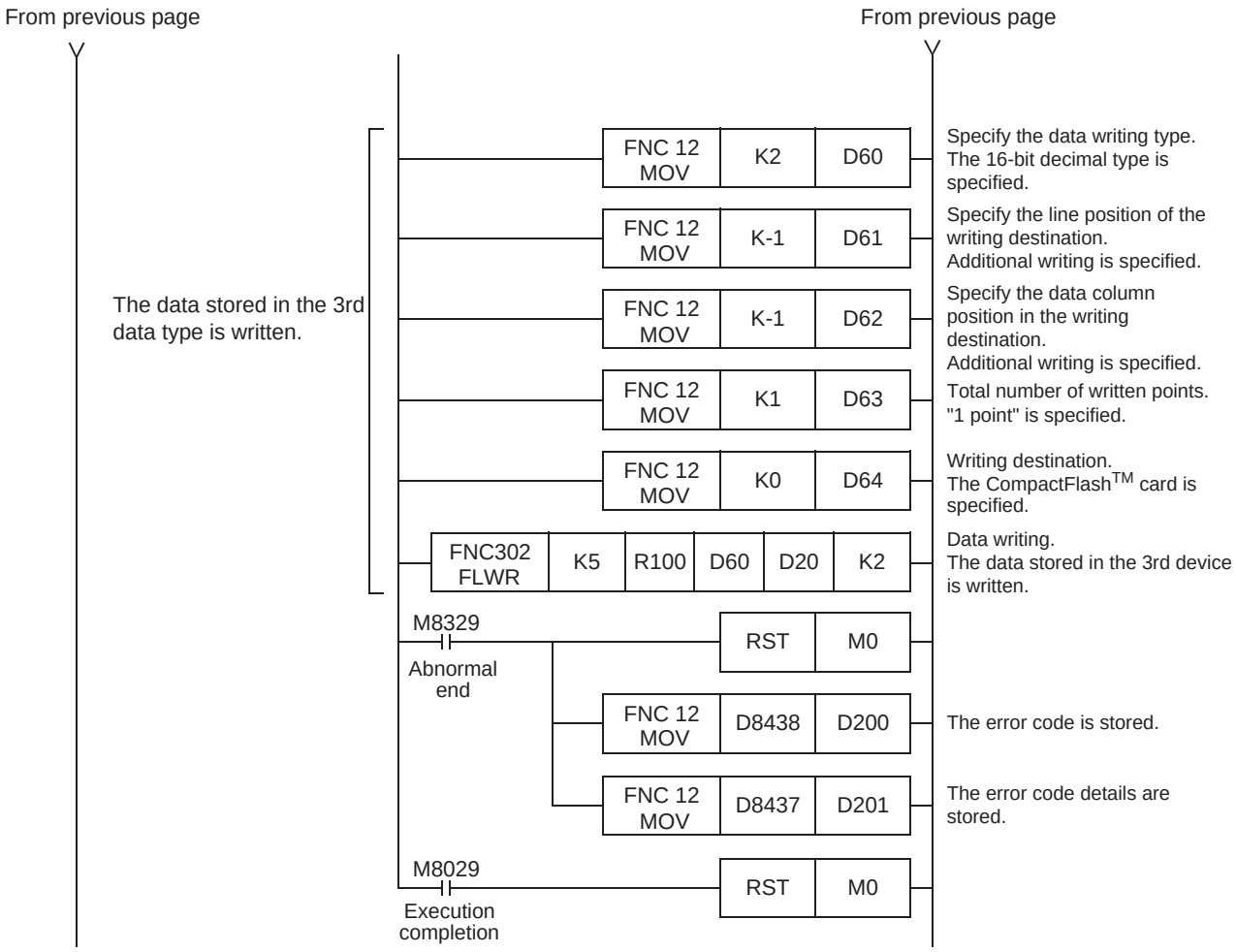

From previous page
From previous page
The data stored in the 3rd data type is written.
FNC 12 MOV K2 D60
Specify the data writing type. The 16-bit decimal type is specified.
FNC 12 MOV K-1 D61
Specify the line position of the writing destination. Additional writing is specified.
FNC 12 MOV K-1 D62
Specify the data column position in the writing destination. Additional writing is specified.
FNC 12 MOV K1 D63
Total number of written points. "1 point" is specified.
FNC 12 MOV K0 D64
Writing destination. The CompactFlash™ card is specified.
FNC302 FLWR K5 R100 D60 D20 K2
Data writing. The data stored in the 3rd device is written.
M8329
Abnormal end
RST M0
FNC 12 MOV D8438 D200
The error code is stored.
FNC 12 MOV D8437 D201
The error code details are stored.
M8029
Execution completion
RST M0

2. When overwriting data in a previously written area

- Set the data writing parameters (line position and column position) in accordance with the written points.
- Use matching settings in a series of FLWR instructions. However, even if matching settings are used, data is written to a column position continuing from the final data of the previous instruction.
- Only data of the same type as the original data can be used for overwriting. When the data type is a character string, only a character string not longer than the original character string can be used for overwriting.
- It is not possible to add data additionally after the final data of an already written (line).
- The time stamp is updated at the time of overwriting.
- The line position after writing is the specified line position. The column position after writing is the column position next to the final written data point. However, if data is written up to the end of a line, the line position after writing is the line position next to the written line position, and the column position after writing is "K1".

Program Example

- Explanation of operation

When X000 turns ON, the data stored in M15 (bit type), data stored in M16 (bit type), and data stored in R200 (16-bit decimal type) overwrites respectively the Index 1 in the following file. The writing destination is the CompactFlash™ card. D20 stores the line position after writing, and D21 stores the column position after writing.
Channel 2 is used in this program. For details on sequence programs, refer to next page.

- Content of file

File ID=K5, The data name is already written.

Before the FLWR instruction is executed

Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	12AB2222	1	0	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	12AB3333	0	1	-44	5	(CR)(LF)
3	2009/ 9/ 9 23:59:04	23CDFFFF	1	1	-4444	55	(CR)(LF)

After the FLWR instruction is executed

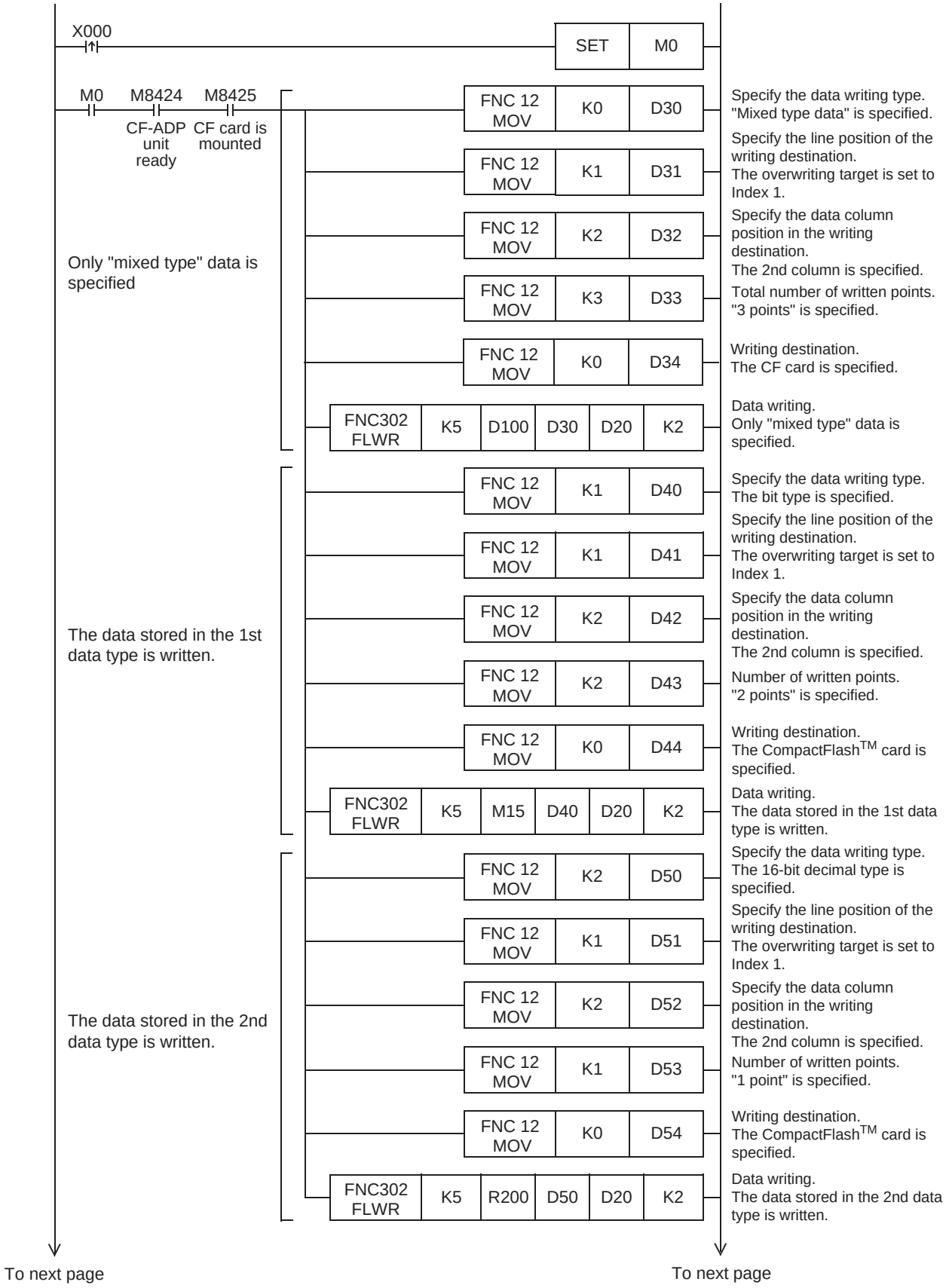
Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/10 10:10:10 The time stamp is updated at the time of overwriting.	12AB2222	1 The existing data is overwritten by the M15 (ON=1).	1 The existing data is overwritten by the M16 (ON=1).	4 The existing data is overwritten by the value stored in R200.	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	12AB3333	0	1	-44	5	(CR)(LF)
3	2009/ 9/ 9 23:59:04	23CDFFFF	1	1	-4444	55	(CR)(LF)

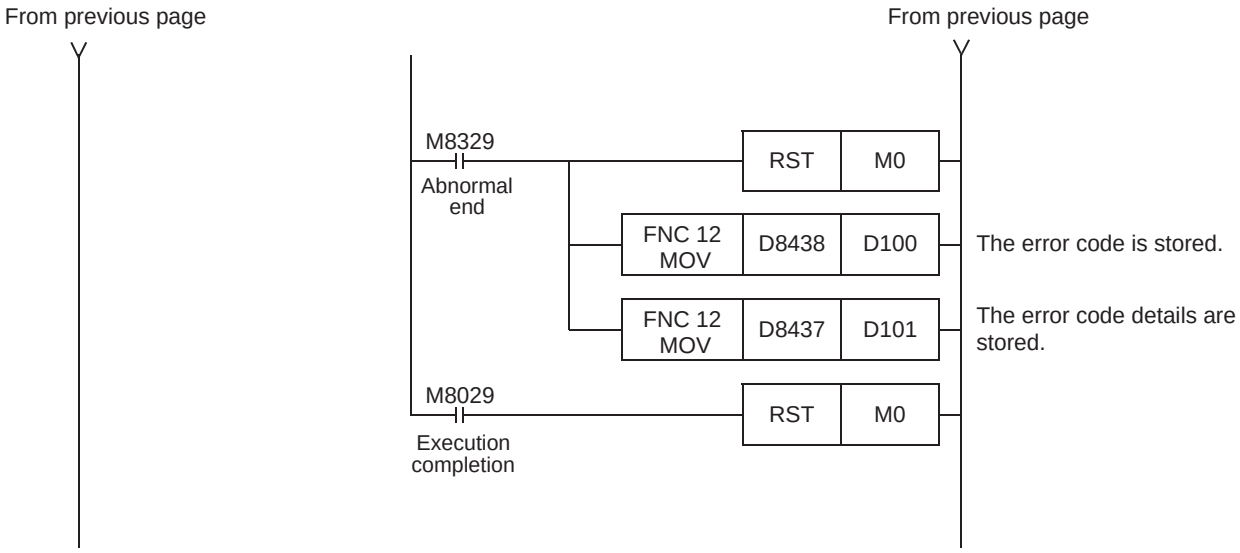
Line position after data is written by the FLWR instruction

Line position after writing D20=K1
Column position after writing : D21=K5

• Sequence program

It is assumed that M15 stores bit data, M16 stores bit data, and R200 stores 16-bit decimal data.
This program does not describe such values.



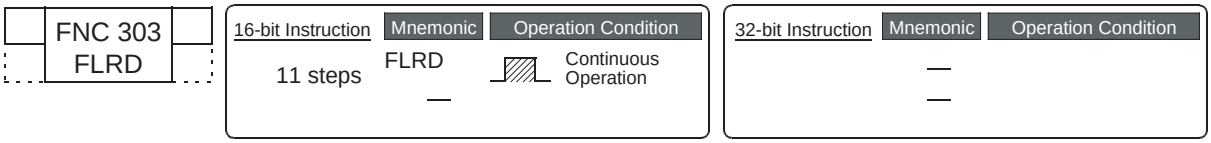

From previous page
From previous page
M8329
Abnormal end
RST
M0
FNC 12 MOV
D8438
D100
The error code is stored.
FNC 12 MOV
D8437
D101
The error code details are stored.
M8029
Execution completion
RST
M0

8.6 FNC 303 - FLRD / Data read

Outline

The FLRD instruction reads data from the CompactFlash™ card.

1. Instruction format



2. Set data

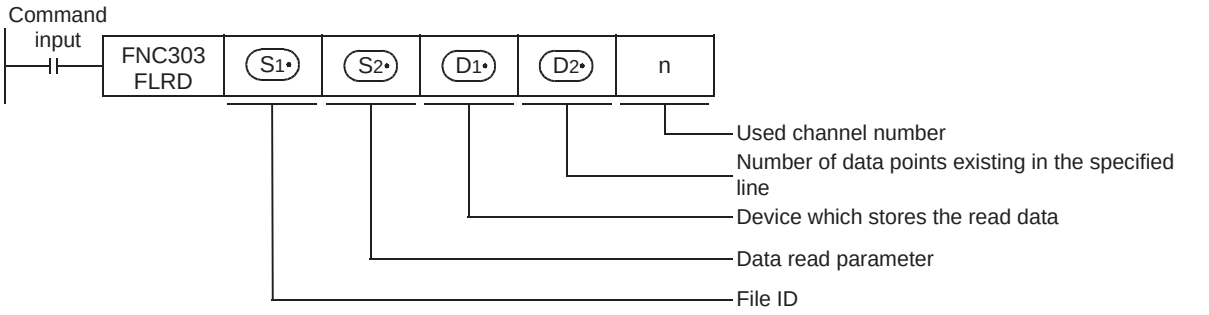
Operand Type	Description	Data Type
(S1•)	File ID (Refer to Subsection 8.6.1)	16-bit binary
(S2•)	Data read parameter (Refer to Subsection 8.6.1)	16-bit binary
(D1•)	Device which stores the read data (Refer to Subsection 8.6.1)	-
(D2•)	Number of data points existing in the specified line (Refer to Subsection 8.6.1)	16-bit binary
n	Used channel number [contents of setting : K1 = ch1, K2 = ch2]	16-bit binary

3. Applicable devices

Operand Type	Bit Devices							Word Devices												Others				
	System User							Digit Specification				System User				Special Unit	Index			Con-stant		Real Number	Charac-ter String	Pointer
	X	Y	M	T	C	S	D□.b	KnX	KnY	KnM	KnS	T	C	D	R	U□\G□	V	Z	Modify	K	H	E	"□"	P
(S1•)														✓	✓				✓	✓	✓			
(S2•)														✓	✓				✓					
(D1•)		✓	✓			✓								✓	✓				✓					
(D2•)														✓	✓				✓					
n																				✓	✓			

Explanation of function and operation

1. 16-bit operation (FLRD)



The FLRD instruction reads corresponding number of data from the position determined by the line position and column position in the file specified by the file ID, and stores the read data to a device specified in (D1•).

When reading data from a file in which only the same type of data exists in one line, refer to Subsection 8.6.2.
When reading data from a file in which different types of data exist in one line, refer to Subsection 8.6.3.

8.6.1 Detailed explanation of setting data

Details of the setting data in the FLRD instruction are as shown below.

Setting items		Description	Data Type
(S1•)		File ID K0 to K63	16-bit binary
Data read parameter	(S2•)	Specify the data reading type K0 : Mixed type K1 : Bit type K2 : Decimal type (16-bit) K3 : Decimal type (32-bit) K4 : Hexadecimal type (16-bit) K5 : Hexadecimal type (32-bit) K6 : Real numbers(Floating point data) Exponent expression type (32-bit) K7 : Character string (512 half-width/full-width characters maximum)	16-bit binary
	(S2•) +1	Specify the line position from which data is read. Line position : K1 to specified maximum number of lines	16-bit binary
	(S2•) +2	Specify the column position from which data is read. Column position : K1 to K254	16-bit binary
	(S2•) +3	Read points K1 to K254	16-bit binary
(D1•)		Device which stores the read data Specify the head of devices which store the data read from the CompactFlash™ card.	-
(D2•)		Number of data points existing in the specified line K1 to K254 K0 : No data	16-bit binary
n		Channel number used by the CF-ADP K1 : ch1 K2 : ch2	16-bit binary

Cautions

1) The FLRD instruction is completed abnormally if a CompactFlash™ card is not mounted.
2) The FLRD instruction may require several scans to acquire data. Use the acquired data only after confirming completion of the FLRD instruction if data consistency is required.
3) It is necessary to set the device number in a multiple of 16 when a bit device is specified in (D1•) and the read data type is anything other than bit. When a word device is specified in (D1•) and the read data type is bit, the FLRD instruction stores data read from the least significant bit of the specified word device.
4) When the data type is anything other than character string and the number of devices which store the read data is insufficient, the FLRD instruction does not read data from the CF-ADP. An error occurs.
5) When the data type is a character string, the character string length is unknown. The PLC stores as much read data as possible. When reading is not completed even after the final device is reached, an error occurs.

8.6.2 Reading data of the same type from a file

"m" data points of the same data type in one line are read as follows.

	Instruction name	File ID (S1・)	Data read parameter (S2・)	Read data (D1・)	Total number of data (D2・)	Used channel number n
Command input	FLRD	K*	(S2・) :K* Data type specification (S2・)+1 :K**** Line position (S2・)+2 :K**** Column position (S2・)+3 :K(m) Points	Device ・ ・ ・ Device +(m-1)	Device	n

Program Example

- Explanation of operation

When X000 turns ON, two decimal (16-bit) data points are read from the 4th column in Index 3 in the following file, and stored in R1000 and R1001. Channel 1 is used in this program.

- Content of file

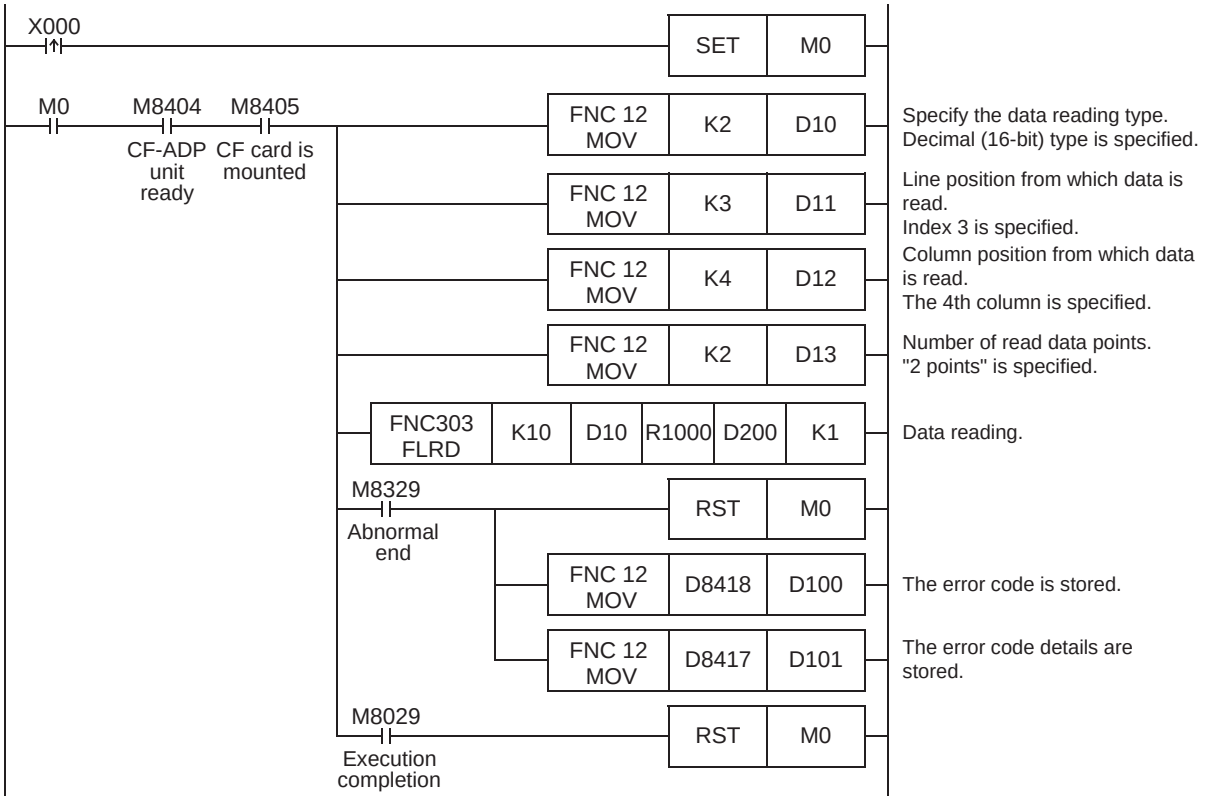
File ID=K10, The data name is already written.

Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	111	222	333	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	1111	2222	3333	-4444	5555	(CR)(LF)
3	2009/ 9/ 9 23:59:04	111	222	333	-444	555	(CR)(LF)

After the FLRD instruction is executed

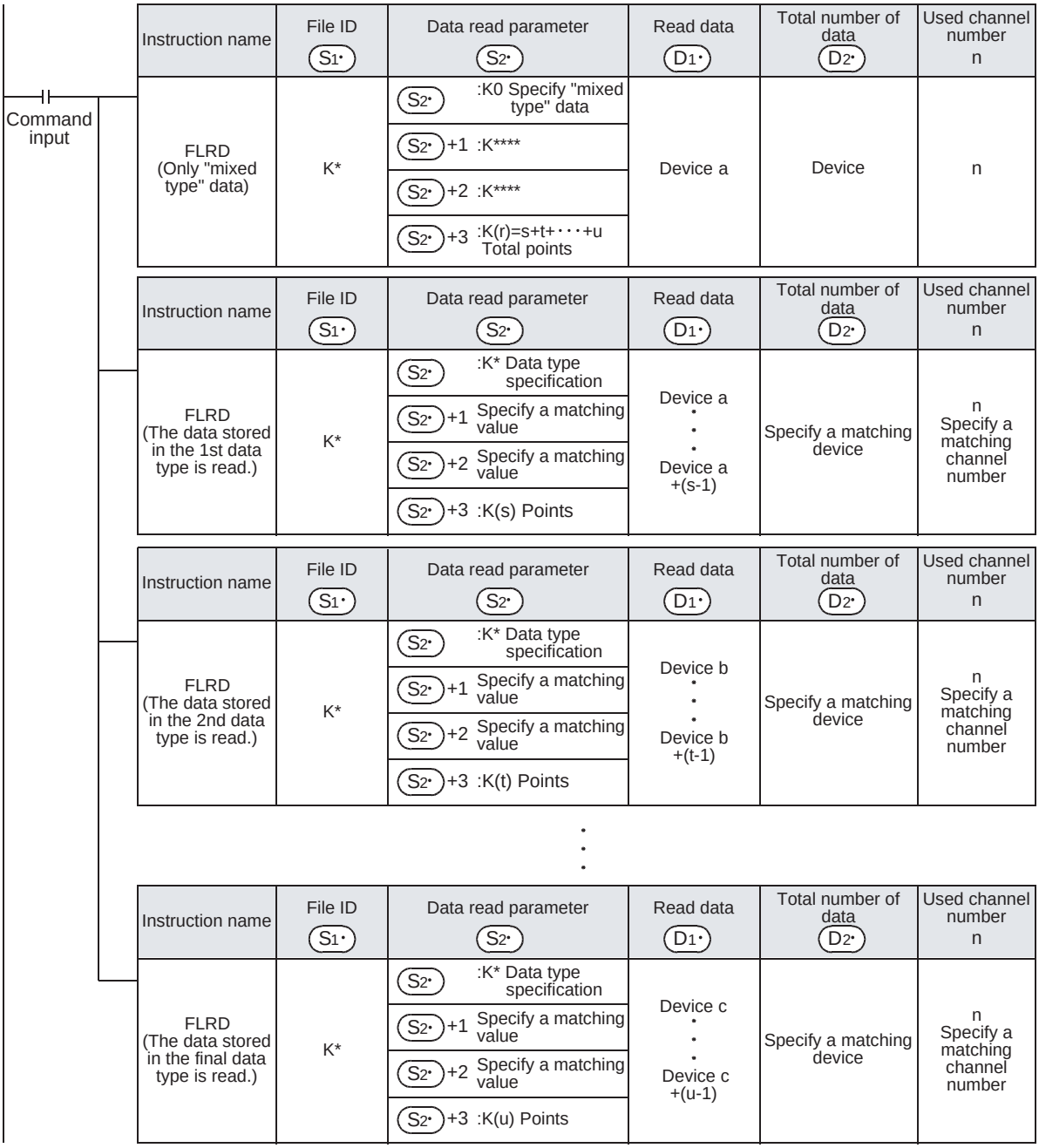
	Device which stores the read data	Value
Read data	R1000	K-444
	R1001	K555
Total number of data	D200	K5

- Sequence program



8.6.3 Reading data of different types from a file

Data of different types in one line are read as follows.



Cautions

1) Do not use another applied instruction for the CF-ADP in between a series of FLRD instructions. Set a common driving condition among a series of FLRD instructions.
2) Set the same file ID, the same line position from which data is read, the same column position from which data is read, and the same channel number among a series of FLRD instructions. Specify a matching device for storing the total number of data points.
3) Make sure that the total number of devices from which data is read is 254 or less.
4) Use a value after the completion of a series of FLRD instructions for the total number of read data points. (s+t+•••u $\leq$ 254)
5) In a series of FLRD instructions, the user can specify a matching device in (S2・) in all FLRD instructions, or specify different devices. When specifying a matching device, it is necessary to change the type (S2・) and number of points (S2・) +3 among FLDR instructions in accordance with each transferred data point using the MOV instruction, etc. (At this time, do not use a pulse type instruction.)

Program Example

- Explanation of operation

When X000 turns ON, 4 data points of different types are read from the 1st column in Index 2 in the following file. Each device shown below stores the read data, and D10 stores the total number of data points. Channel 2 is used in this program.

- Content of file

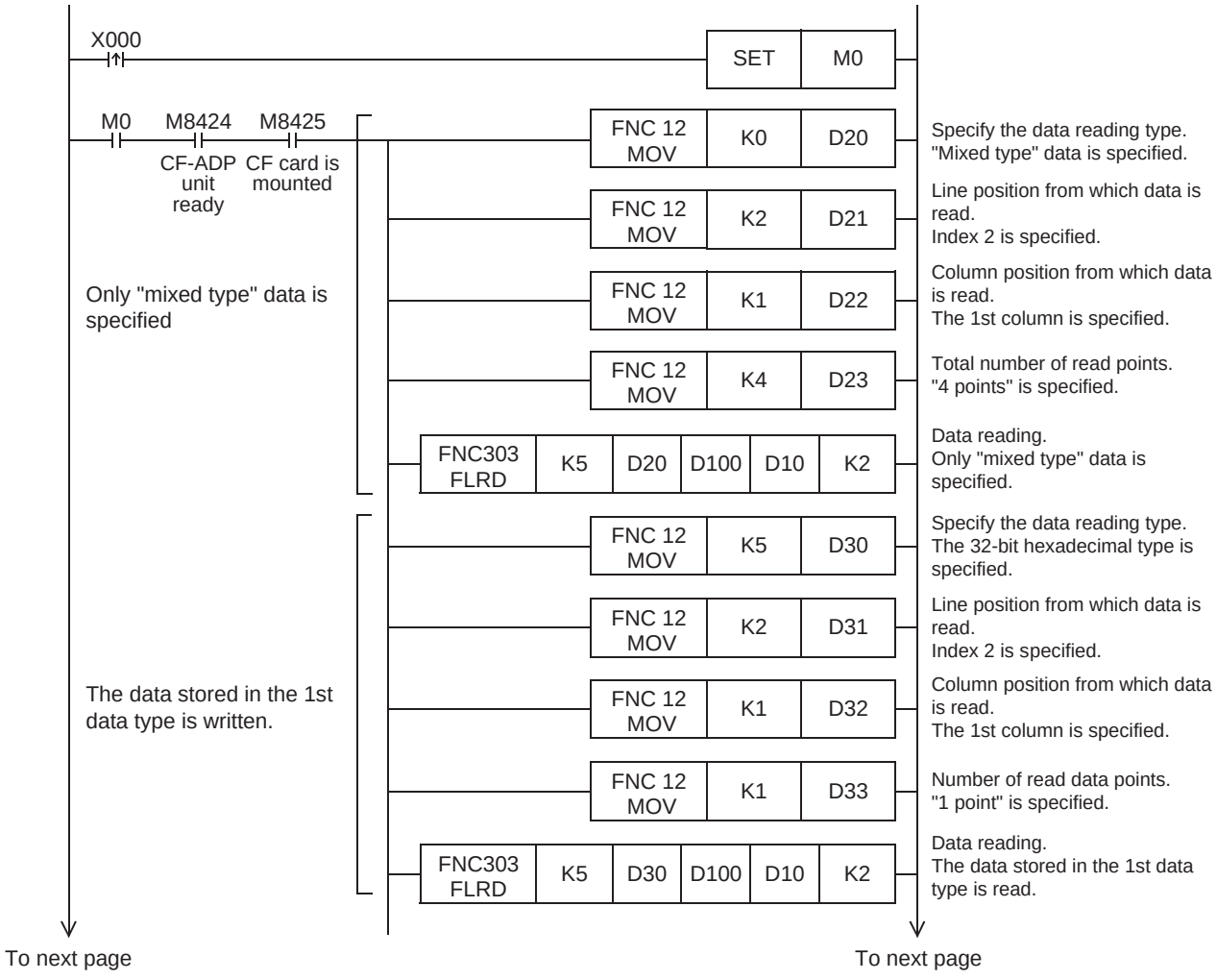
File ID=K5,The data name is already written.

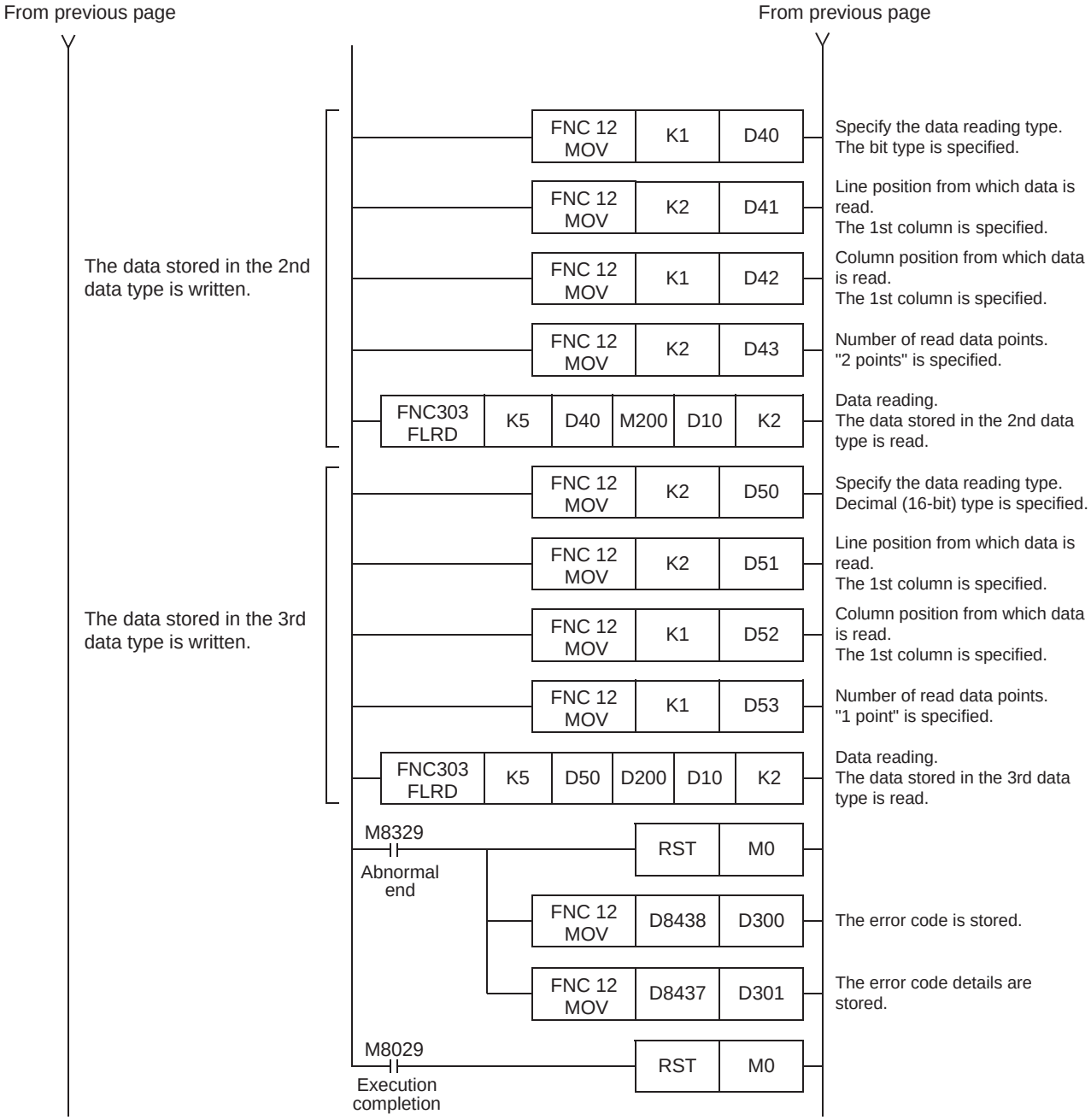
Index	DATE TIME	Data1	Data2	Data3	Data4	Data5	(CR)(LF)
1	2009/ 9/ 9 23:59:00	12AB2222	1	0	-444	555	(CR)(LF)
2	2009/ 9/ 9 23:59:02	12AB3333	0	1	-44	5	(CR)(LF)
3	2009/ 9/ 9 23:59:04	23CDFFFF	0	0	-444	555	(CR)(LF)

After the FLRD instruction is executed

	Device which stores the read data	Value
Read data	D101,D100	H12AB3333
	M200	K0=OFF
	M201	K1=ON
	D200	K-44
Total number of data	D10	K5

- Sequence program



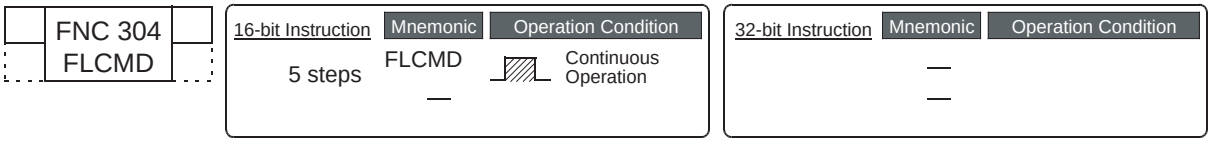

From previous page
From previous page
The data stored in the 2nd data type is written.
FNC 12 MOV K1 D40
Specify the data reading type. The bit type is specified.
FNC 12 MOV K2 D41
Line position from which data is read. The 1st column is specified.
FNC 12 MOV K1 D42
Column position from which data is read. The 1st column is specified.
FNC 12 MOV K2 D43
Number of read data points. "2 points" is specified.
FNC303 FLRD K5 D40 M200 D10 K2
Data reading. The data stored in the 2nd data type is read.
The data stored in the 3rd data type is written.
FNC 12 MOV K2 D50
Specify the data reading type. Decimal (16-bit) type is specified.
FNC 12 MOV K2 D51
Line position from which data is read. The 1st column is specified.
FNC 12 MOV K1 D52
Column position from which data is read. The 1st column is specified.
FNC 12 MOV K1 D53
Number of read data points. "1 point" is specified.
FNC303 FLRD K5 D50 D200 D10 K2
Data reading. The data stored in the 3rd data type is read.
M8329
Abnormal end
RST M0
FNC 12 MOV D8438 D300
The error code is stored.
FNC 12 MOV D8437 D301
The error code details are stored.
M8029
Execution completion
RST M0

8.7 FNC 304 - FLCMD / FX3U-CF-ADP command

Outline

The FLCMD instruction gives instruction for operation to the FX3U-CF-ADP.

1. Instruction format



2. Set data

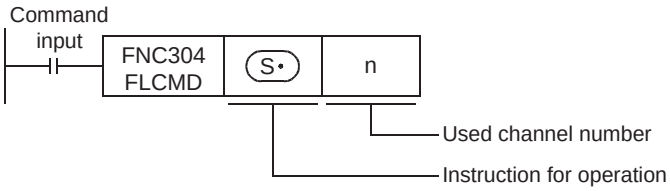
Operand Type	Description	Data Type
(S•)	Instruction for operation (Refer to Subsection 8.7.1)	16-bit binary
n	Used channel number [contents of setting : K1 = ch1, K2 = ch2]	16-bit binary

3. Applicable devices

Operand Type	Bit Devices							Word Devices												Others				
	System User							Digit Specification				System User				Special Unit	Index			Con-stant		Real Number	Charac-ter String	Pointer
	X	Y	M	T	C	S	D□.b	KnX	KnY	KnM	KnS	T	C	D	R	U□\G□	V	Z	Modify	K	H	E	"□"	P
(S•)														✓	✓				✓	✓	✓			
n																				✓	✓			

Explanation of function and operation

1. 16-bit operation (FLCMD)



The FLCMD instruction gives instruction for operation to the CF-ADP.
The contents of instruction are as follows.

- When (S•) is "K-1", the FLCMD instruction forcibly writes all buffered data (stored in the buffer inside the CF-ADP) to the CompactFlash™ card.
- When (S•) is "K0" to "K63", the FLCMD instruction forcibly writes the buffered data of the specified file ID (stored in the buffer inside the CF-ADP) to the CompactFlash™ card.
- When (S•) is "K256 (H100)", the FLCMD instruction sets the CompactFlash™ card to the mounted status if it is in the unmounted status.
- When (S•) is "K512 (H200)", the FLCMD instruction sets the CompactFlash™ card to the unmounted status if it is in the mounted status.
- When (S•) is "K1280 (H500)", the FLCMD instruction clears error codes stored in the CF-ADP.

For details, refer to Subsection 8.7.1.

8.7.1 Detailed explanation of setting data

Details of the setting data in the FLCMD instruction are as shown below.

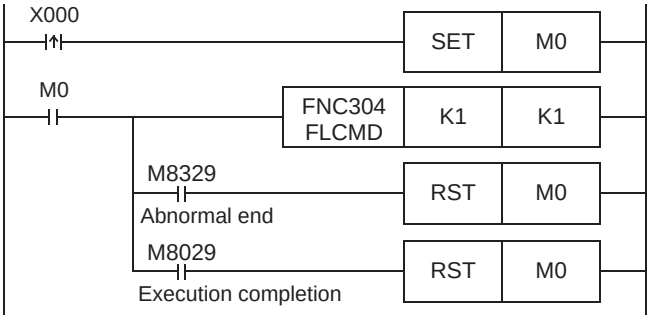
Setting items	Description	Data Type
(S•)	Contents of instruction for operation K-1 : Forcibly writes all buffered data to the CompactFlash™ card. K0 to K63 : Forcibly writes the buffered data of the specified file ID to the CompactFlash™ card. K256(H100) : Sets the CompactFlash™ card to the mounted status*1. K512(H200) : Sets the CompactFlash™ card to the unmounted status*2. K1280(H500) : Clears error codes stored in the CF-ADP.	16-bit binary
n	Channel number used by the CF-ADP K1 : ch1 K2 : ch2	16-bit binary

*1. The CompactFlash™ card is available in the "mounted" status.

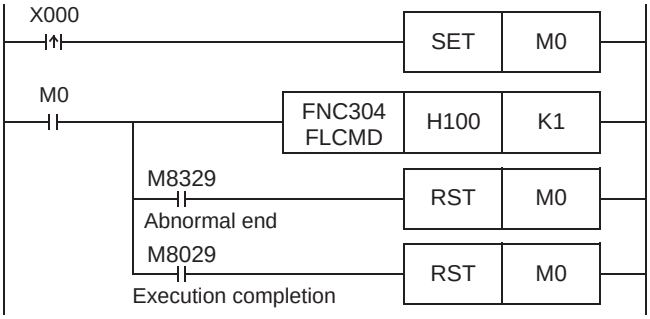
*2. The CompactFlash™ card is unavailable in the "unmounted" status.

Program Example

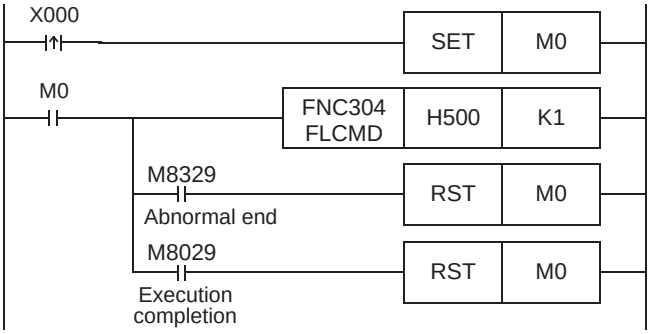
1) Program Example 1
When X000 turns ON, the data (saved in the file whose ID is "1") stored in the buffer inside the CF-ADP is forcibly written to the CompactFlash™ card.
Channel number 1 is used.



2) Program Example 2
When X000 turns ON, the CompactFlash™ card is set to the mounted status.
Channel number 1 is used.



3) Program Example 3
When X000 turns ON, error codes stored in the CF-ADP are cleared.
Channel number 1 is used.

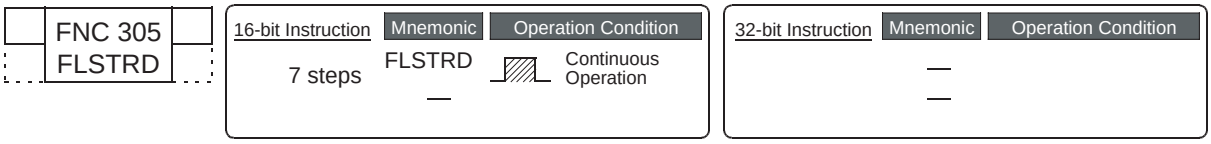


8.8 FNC 305 - FLSTRD / FX3U-CF-ADP status read

Outline

The FLSTRD instruction reads the status (including the error information and file information) of the FX3U-CF-ADP.

1. Instruction format



2. Set data

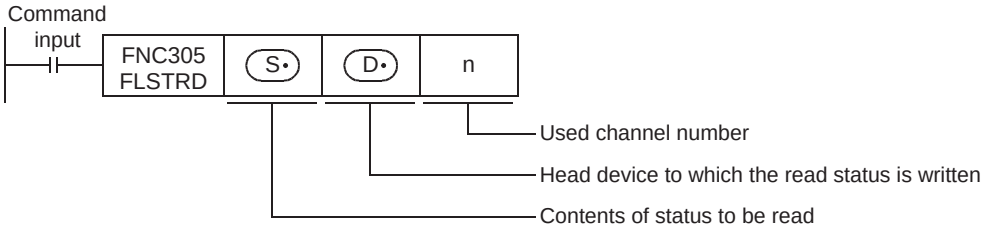
Operand Type	Description	Data Type
(S•)	Contents of status to be read (Refer to Subsection 8.8.1)	16-bit binary
(D•)	Head device to which the read status is written (Refer to Subsection 8.8.1)	16-bit binary
n	Used channel number [contents of setting : K1 = ch1, K2 = ch2]	16-bit binary

3. Applicable devices

Operand Type	Bit Devices							Word Devices												Others				
	System User							Digit Specification				System User				Special Unit	Index			Constant		Real Number	Character String	Pointer
	X	Y	M	T	C	S	D□.b	KnX	KnY	KnM	KnS	T	C	D	R	U□\G□	V	Z	Modify	K	H	E	"□"	P
(S•)														✓	✓				✓	✓	✓			
(D•)														✓	✓				✓					
n																				✓	✓			

Explanation of function and operation

1. 16-bit operation (FLSTRD)



The FLSTRD instruction reads the status information of the CF-ADP. The following contents can be read.

The number of data stored in (D•) varies depending on the contents of the read status.

- When (S•) is "K0" to "K63" the FLSTRD instruction reads the final line position and final column position of each file.
- When (S•) is "K256 (H100)" the FLSTRD instruction reads file IDs stored in the CompactFlash™ card.
- When (S•) is "K512 (H200)" the FLSTRD instruction reads the data capacity.
- When (S•) is "K768 (H300)" the FLSTRD instruction reads the version information of the CF-ADP.
- When (S•) is "K1024 (H400)" the FLSTRD instruction reads the error information (error flag) for errors having occurred in the CF-ADP.
- When (S•) is "K1280 (H500)" the FLSTRD instruction reads error codes and error code details. Up to 5 of the latest error codes and error code details can be stored.

For details, refer to Subsection 8.8.1.

8.8.1 Detailed explanation of setting data

Details of the setting data in the FLSTRD instruction are as shown below.

Setting items	Description	Data Type
(S•)	Contents of status to be read K0 to K63 : Final line position of each file K256(H100) : File IDs stored in the CompactFlash™ card K512(H200) : Capacity of the CompactFlash™ card K768(H300) : Version of the CF-ADP K1024(H400) : Error information (error flag) K1280(H500) : Error codes	16-bit binary
(D•)	Head device to which the read status is written The number of data points stored in (D•) varies depending on the contents of the read status.	16-bit binary
n	Channel number used by the CF-ADP K1 : ch1 K2 : ch2	16-bit binary

- When (S•) is "K0" to "K63"
  The FLSTRD instruction reads the final line position and final column position of each file.

Setting items	Description
(D•)	Final line position K1 to the specified maximum line position
(D•) +1	Final column position

- When (S•) is "K256 (H100)"
  The FLSTRD instruction reads file IDs stored in the CompactFlash™ card. For a file ID corresponding to the read data, refer to the file ID correspondence table shown below.
  When a file exists, a bit corresponding to the file ID turns ON.

Setting items	Description
(D•)	Stores the existence of file IDs.
(D•) +1	
(D•) +2	
(D•) +3	

File ID correspondence table

Setting items	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
(D•)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
(D•) +1	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
(D•) +2	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
(D•) +3	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48

- When (S•) is "K512 (H200)"
  The FLSTRD instruction reads the data capacity, used space and free space of the CompactFlash™ card to the following devices respectively.

Setting items	Description
(D•) +1, (D•)	Data capacity of the CompactFlash™ card (kB) Units, If the data capacity is less than 1 kB, "1" is stored.
(D•) +3, (D•) +2	Used space of the CompactFlash™ card (kB) Units, If the data size is less than 1 kB, "1" is stored.
(D•) +5, (D•) +4	Free space of the CompactFlash™ card (kB) Units, If the data size is less than 1 kB, "1" is stored.

- When (S•) is "K768 (H300)"
  The FLSTRD instruction reads the version information of the CF-ADP.

Setting items	Description
(D•)	Stores the version of CF-ADP. (Example) K100 = Ver.1.00

- When (S•) is "K1024 (H400)"
  The FLSTRD instruction reads the error information (error flag).

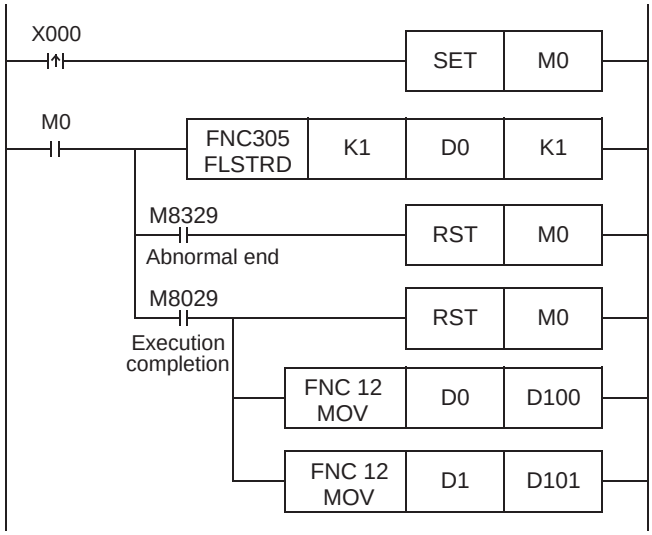
Setting items	Description
(D•)	Error detection signal b0 : The CompactFlash™ card is not mounted. b1 : The CompactFlash™ card is full. b2 : An error has occurred in the CF-ADP. b3 : CF-ADP H/W error b4 : CompactFlash™ card error b5 to b15 : Not used

- When (S•) is "K1280 (H500)"
  The FLSTRD instruction reads the error code and error code details for errors having occurred in the CF-ADP. Up to 5 of the latest error codes and error code details can be stored.

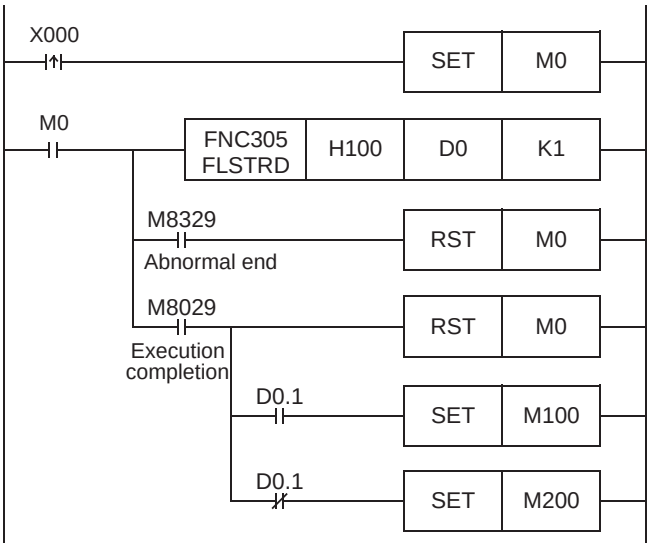
Setting items	Description
(D•)	Error code 1
(D•) +1	Error code details 1
(D•) +2	Error code 2
(D•) +3	Error code details 2
(D•) +4	Error code 3
(D•) +5	Error code details 3
(D•) +6	Error code 4
(D•) +7	Error code details 4
(D•) +8	Error code 5
(D•) +9	Error code details 5

Program Example

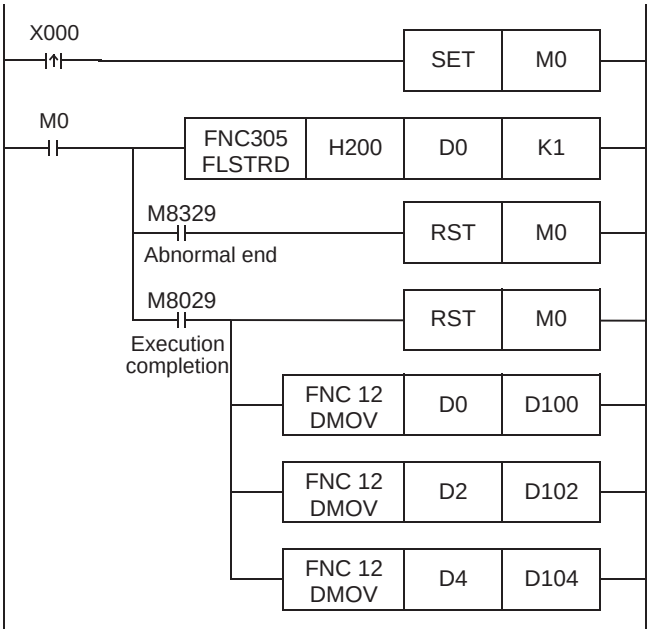
1) Program Example 1
   When X000 turns ON, the FLSTRD instruction reads the status information. D100 stores the final line position of a file whose ID is "1", and D101 stores the final digit position.
   Channel number 1 is used.



2) Program Example 2
When X000 turns ON, the FLSTRD instruction checks whether or not a file whose ID is "1" exists. M100 turns ON when a file whose ID is "1" exists.
Channel number 1 is used.



3) Program Example 3
When X000 turns ON, the FLSTRD instruction reads the capacity of the CompactFlash™ card. D101 and D100 store the data capacity of the CompactFlash™ card, D103 and D102 store the used space of the CompactFlash™ card, and D105 and D104 store the free space of the CompactFlash™ card.
Channel number 1 is used.



8.9 Contents of Related Devices

The tables below show special auxiliary relays and special data registers used in CF-ADP instructions (FNC300 (FLCRT) to FNC305 (FLSTRD)).
For details on the related devices, refer to Appendix A-2.

1. Special auxiliary relays

R: Read only W: Write only R/W: Read or Write

Device		Name	Description	R/W
ch1	ch2			
M8029		Instruction execution complete	Turns ON when the execution of CF-ADP instructions is completed, and remains ON for 1 scan.	R
M8329		Instruction execution abnormal end	Turns ON when the execution of CF-ADP instructions has ended abnormally, and remains ON for 1 scan.	R
M8067		Operation error	Turns ON when an operation error occurs.	R
M8402	M8422	CF-ADP instruction executing	Remains ON while an instruction for the CF-ADP is being executed.	R
M8404	M8424	CF-ADP unit ready	Remains ON when the CF-ADP is ready for receiving commands.	R
M8405	M8425	CF card mount status	ON : CompactFlash™ card mounted status OFF : CompactFlash™ card unmounted status	R
M8410	M8430	CF-ADP status renewal stop	Stops communication executed by the system to update the status of special data registers (D8406 and D8426)*2	R/W
M8418	M8438	CF-ADP instruction error*1	Turns ON when an error occurs in an instruction for the CF-ADP.	R/W

*1. Cleared when the PLC mode is changed from STOP to RUN.

*2. When an instruction for the CF-ADP is driven while the system is updating the status of special data registers, execution of the instruction for the CF-ADP may be delayed by several scans. If this delay is regarded as a problem, use this flag to stop the updating of the status.

2. Special data registers

R: Read only W: Write only R/W: Read or Write

Device		Name	Description	R/W
ch1	ch2			
D8067		Error code for operation error	Stores the error code when an operation error occurs.	R
D8402 D8403	D8422 D8423	Step number of executing CF-ADP instruction*1	Stores the step number of an instruction for the CF-ADP.	R
D8406	D8426	CF-ADP status	Stores the status information of the CF-ADP.	R
D8408	D8428	CF-ADP version	Stores the version of the CF-ADP.	R
D8414 D8415	D8434 D8435	Error step number of M8418, Error step number of M8438*1	Stores the step number of an instruction for the CF-ADP where an error occurs.	R
D8417	D8437	Error code in detail for CF-ADP instructions*1	Stores error code details when an error occurs in an instruction for the CF-ADP.	R
D8418	D8438	Error code for CF-ADP instructions*1	Stores the error code when an error occurs in an instruction for the CF-ADP.	R
D8419	D8439	Operation mode display	Stores the communication function status being executed.	R

*1. Cleared when the PLC mode is changed from STOP to RUN.

9. Program Examples

STARTUP AND MAINTENANCE PRECAUTIONS DANGER

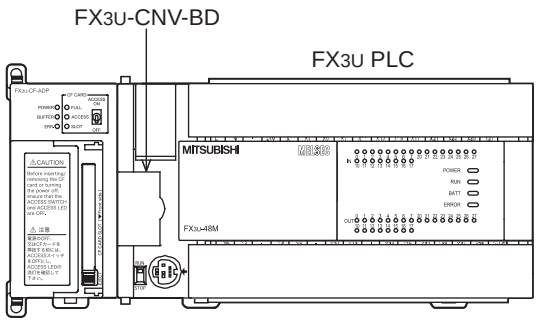
- Make sure to connect the battery correctly. Do not charge, disassemble, heat, short-circuit, or expose the battery to fire.
  Doing so may rupture or ignite it.
- Do not touch any terminal while the PLC's power is on.
  Doing so may cause electric shock or malfunctions.
- Before modifying or disrupting the program in operation or running the PLC, carefully read through this manual and the associated manuals and ensure the safety of the operation.
  An operation error may damage the machinery or cause accidents.

STARTUP AND MAINTENANCE PRECAUTIONS CAUTION

- Do not disassemble or modify the PLC.
  Doing so may cause fire, equipment failures, or malfunctions.
  For repair, contact your local Mitsubishi Electric distributor.
- Turn off the power to the PLC before attaching or detaching the following devices.
  Failure to do so may cause device failures or malfunctions.
  - Peripheral devices, display modules, expansion boards and special adapters
  - I/O extension units/blocks, FX Series terminal block and the special function units/blocks
  - Battery and memory cassette

9.1 System Configuration

The system configuration shown below explains the program examples.
The CF-ADP differs in assignment of the channel number by a system configuration.
Change the channel number if necessary in accordance with the actual system configuration.
For details of assignment of the channel number, refer to the Section 3.4.



FX3U-CF-ADP
(ch1)

- Program example 1
  A 32-bit decimal type file is created, written, read and deleted.
  For details, refer to Section 9.2.
- Program example 2
  A file saving different types of data is created, written, read and deleted.
  For details, refer to Section 9.3.
- Program example 3
  Error codes, error code details and error information (error flag) of the CF-ADP are read.
  For details, refer to Section 9.4.

9.2 Program Example 1

9.2.1 Operation details

- When X000 turns ON, the following file is created.
  If a file whose file ID is "1" already exists in the CompactFlash™ card, file creation and data name writing are aborted.
  - File ID = 1
  - File name = DWORD_01
  - Data type = Decimal type (32 bit)
- When X001 turns ON, 10 data points of 32-bit decimal type stored in D400 to D419 are written additionally to the internal buffer of the CF-ADP. When the number of times of additional writing to the internal buffer reaches 10, later data will be written additionally to the file "DWORD_01" stored in the CompactFlash™ card.
- When X002 turns ON, 10 data points of 32-bit decimal type are read from the final line in the 32-bit decimal type file "DWORD_01".
  Data reading should be executed after data writing.
- When X003 turns ON, the 32-bit decimal type file "DWORD_01" is deleted.

9.2.2 Example of a 32-bit decimal type file in "csv" format after writing

When a "csv" file is created and then data is written to the file 20 times, its contents are as shown below. Numeric values are stored in shaded areas.

Index	DATE TIME	Device1	Device2	Device3	Device4	Device5	Device6	Device7	Device8	Device9	Device10
1	2009/ 9/ 9 23:59:00	0	0	0	0	0	0	100000	300000	500000	700000
2	2009/ 9/ 9 23:59:02	1	10	100	1000	10000	100000	90000	290000	490000	690000
3	2009/ 9/ 9 23:59:04	2	20	200	2000	20000	200000	80000	280000	480000	680000
4	2009/ 9/ 9 23:59:06	3	30	300	3000	30000	300000	70000	270000	470000	670000
5	2009/ 9/ 9 23:59:08	4	40	400	4000	40000	400000	60000	260000	460000	660000
6	2009/ 9/ 9 23:59:10	5	50	500	5000	50000	500000	50000	250000	450000	650000
7	2009/ 9/ 9 23:59:20	6	60	600	6000	60000	600000	40000	240000	440000	640000
8	2009/ 9/ 9 23:59:22	7	70	700	7000	70000	700000	30000	230000	430000	630000
9	2009/ 9/ 9 23:59:24	8	80	800	8000	80000	800000	20000	220000	420000	620000
10	2009/ 9/ 9 23:59:26	9	90	900	9000	90000	900000	10000	210000	410000	610000
11	2009/ 9/ 9 23:59:28	10	100	1000	10000	100000	0	200000	400000	600000	800000
12	2009/ 9/ 9 23:59:30	9	90	900	9000	90000	900000	190000	390000	590000	790000
13	2009/ 9/ 9 23:59:32	8	80	800	8000	80000	800000	180000	380000	580000	780000
14	2009/ 9/ 9 23:59:34	7	70	700	7000	70000	700000	170000	370000	570000	770000
15	2009/ 9/ 9 23:59:36	6	60	600	6000	60000	600000	160000	360000	560000	760000
16	2009/ 9/ 9 23:59:38	5	50	500	5000	50000	500000	150000	350000	550000	750000
17	2009/ 9/ 9 23:59:40	4	40	400	4000	40000	400000	140000	340000	540000	740000
18	2009/ 9/ 9 23:59:42	3	30	300	3000	30000	300000	130000	330000	530000	730000
19	2009/ 9/ 9 23:59:44	2	20	200	2000	20000	200000	120000	320000	520000	720000
20	2009/ 9/ 9 23:59:46	1	10	100	1000	10000	100000	110000	310000	510000	710000

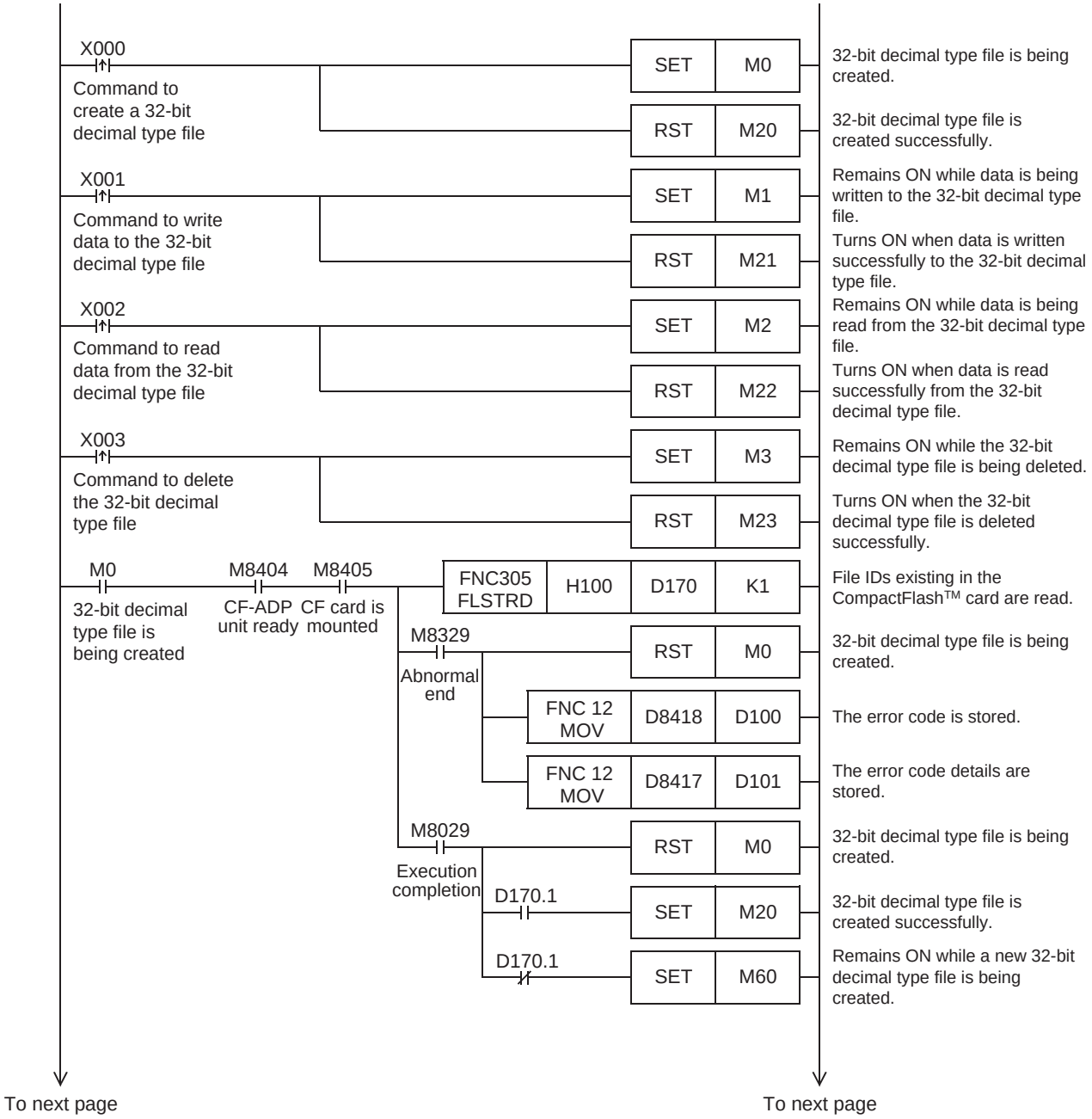
9.2.3 Device Assignments

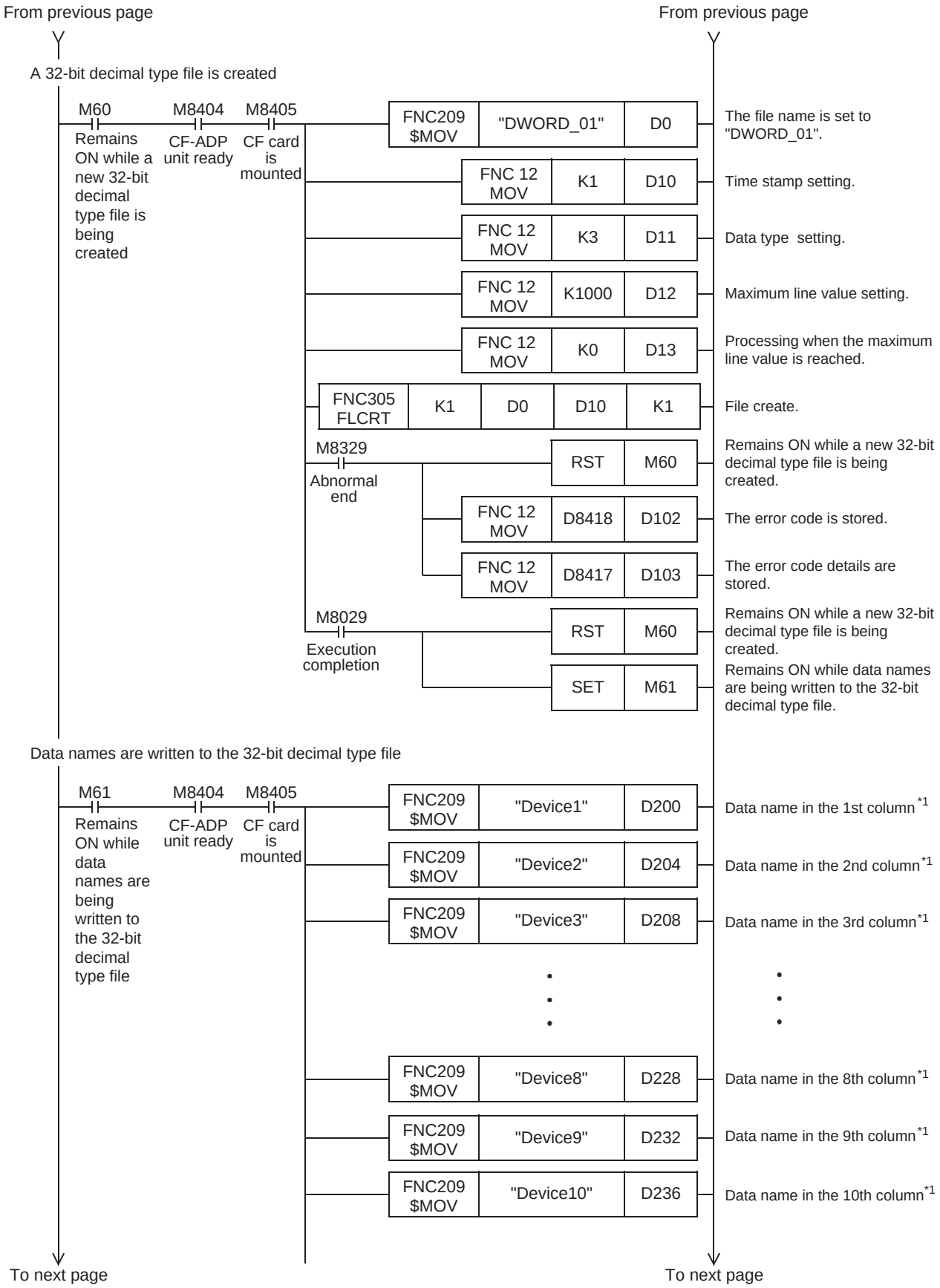
Device No.	Contents of operation
X000	Creates a 32-bit decimal type file, and writes data names.
X001	Writes data to the 32-bit decimal type file.
X002	Reads data from the 32-bit decimal type file.
X003	Deletes the 32-bit decimal type file.
M0	Remains ON while the 32-bit decimal type file is being created.
M1	Remains ON while data is being written to the 32-bit decimal type file.
M2	Remains ON while data is being read from the 32-bit decimal type file.
M3	Remains ON while the 32-bit decimal type file is being deleted.
M20	Turns ON when the 32-bit decimal type file is created successfully or already exists.
M21	Turns ON when data is written successfully to the 32-bit decimal type file.
M22	Turns ON when data is read successfully from the 32-bit decimal type file.
M23	Turns ON when the 32-bit decimal type file is deleted successfully.
M28	Turns ON when forcible writing of buffered data to the CompactFlash™ card is completed successfully.
M60	Remains ON while a new 32-bit decimal type file is being created.
M61	Remains ON while data names are being written to the 32-bit decimal type file.
D0 to D4	File name
D10	Time stamp setting
D11	Data type
D12	Maximum line position setting
D13	Processing when the maximum line position is reached
D20	Specify the data writing type.
D21	Specify the line position of the writing destination.
D22	Specify the data column position in the writing destination.
D23	Number of written data points.
D24	Writing destination. (Internal buffer inside the CF-ADP/CompactFlash™ card)
D28	Executes forcible writing of buffered data to the CompactFlash™ card after data is written to the buffer 10 times
D30	Specify the line position of the writing destination.
D31	Specify the data column position in the writing destination.
D40	Specify the data reading type.
D41	Specify the line position from which data is read.
D42	Column position from which data is read.
D43	Number of read data points.
D50	Number of data points existing in the specified Index
D100/D101	Error code/error code details when existence of a file whose file ID is "1" is confirmed
D102/D103	Error code/error code details when the 32-bit decimal type file is created
D104/D105	Error code/error code details when data names are written to the 32-bit decimal type file
D106/D107	Error code/error code details when data is written to the 32-bit decimal type file
D108/D109	Error code/error code details when buffered data is forcibly written to the CompactFlash™ card
D110/D111	Error code/error code details when data is read from the 32-bit decimal type file
D112/D113	Error code/error code details when the 32-bit decimal type file is deleted
D170	File ID information read when the 32-bit decimal type file is created
D200 to D239	Data name data written to the 32-bit decimal type file
D400 to D419	32-bit decimal data written to the 32-bit decimal type file
D430 to D449	32-bit decimal data read from the 32-bit decimal type file

9.2.4 Sequence Program

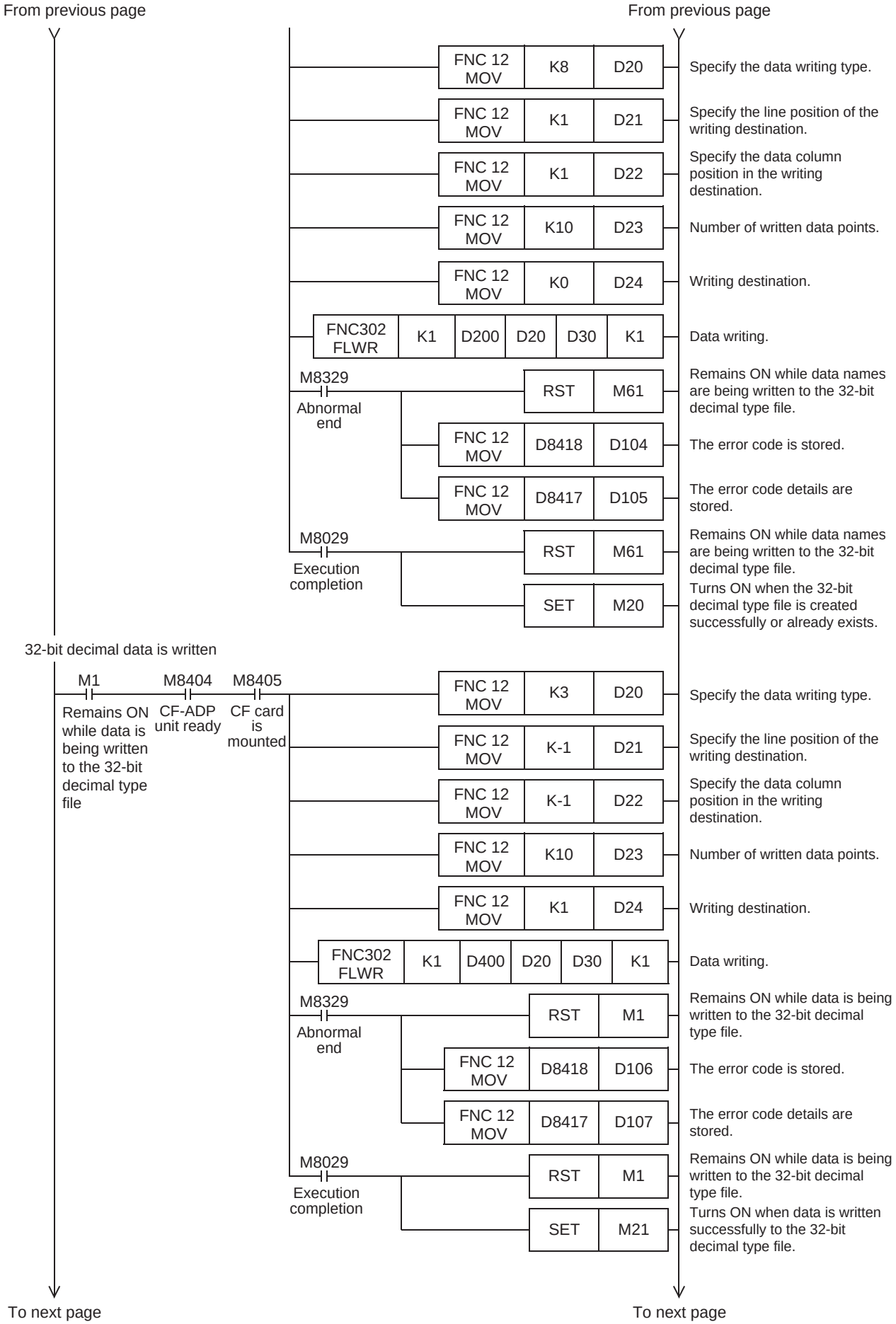
This program example describes the sequence program for channel 1 (ch1).
Rewrite the channel No. with the actual system configuration to be used.

→ **For explanation of operations, refer to Subsection 9.2.1.**
→ **For an example of a 32-bit decimal type file in "csv" format after writing, refer to Subsection 9.2.2.**
→ **For device assignments, refer to Subsection 9.2.3.**





*1. When (S2•) is "K7" or "K8", 00H, which indicates the end of the string, must be added to the end of the character string. In addition, in sequence example, it is written in such a way that "00H" is placed in a blank area of a character string. When a character string is modified, it is necessary ensure that "00H" is placed at the end of the character string.


From previous page
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FNC 12 MOV K8 D20
Specify the data writing type.
FNC 12 MOV K1 D21
Specify the line position of the writing destination.
FNC 12 MOV K1 D22
Specify the data column position in the writing destination.
FNC 12 MOV K10 D23
Number of written data points.
FNC 12 MOV K0 D24
Writing destination.
FNC302 FLWR K1 D200 D20 D30 K1
Data writing.
M8329
Abnormal end
RST M61
Remains ON while data names are being written to the 32-bit decimal type file.
FNC 12 MOV D8418 D104
The error code is stored.
FNC 12 MOV D8417 D105
The error code details are stored.
M8029
Execution completion
RST M61
Remains ON while data names are being written to the 32-bit decimal type file.
SET M20
Turns ON when the 32-bit decimal type file is created successfully or already exists.
32-bit decimal data is written
M1
Remains ON while data is being written to the 32-bit decimal type file
M8404
CF-ADP unit ready
M8405
CF card is mounted
FNC 12 MOV K3 D20
Specify the data writing type.
FNC 12 MOV K-1 D21
Specify the line position of the writing destination.
FNC 12 MOV K-1 D22
Specify the data column position in the writing destination.
FNC 12 MOV K10 D23
Number of written data points.
FNC 12 MOV K1 D24
Writing destination.
FNC302 FLWR K1 D400 D20 D30 K1
Data writing.
M8329
Abnormal end
RST M1
Remains ON while data is being written to the 32-bit decimal type file.
FNC 12 MOV D8418 D106
The error code is stored.
FNC 12 MOV D8417 D107
The error code details are stored.
M8029
Execution completion
RST M1
Remains ON while data is being written to the 32-bit decimal type file.
SET M21
Turns ON when data is written successfully to the 32-bit decimal type file.
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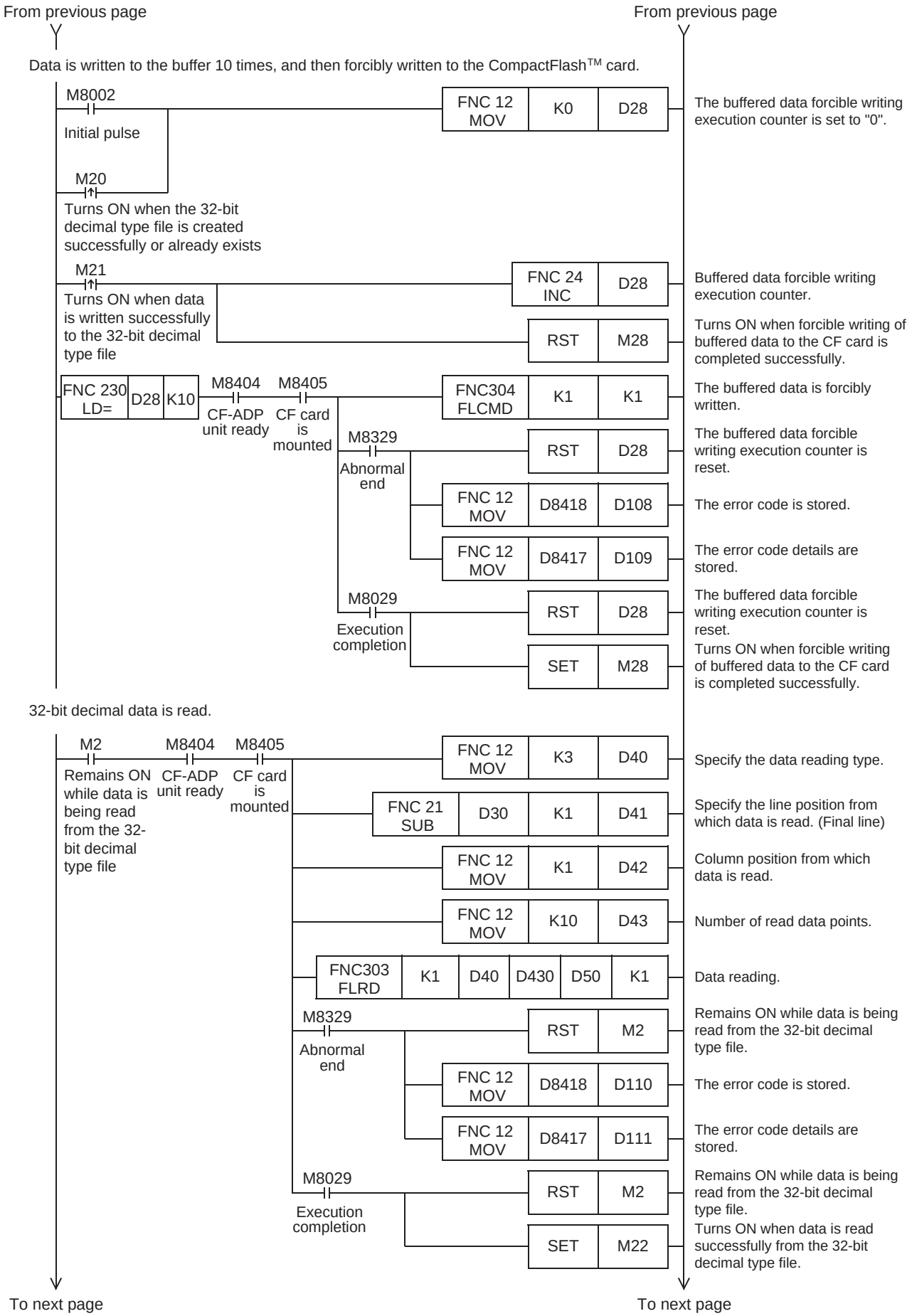
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Data is written to the buffer 10 times, and then forcibly written to the CompactFlash™ card.
M8002
Initial pulse
FNC 12 MOV K0 D28
The buffered data forcible writing execution counter is set to "0".
M20
Turns ON when the 32-bit decimal type file is created successfully or already exists
M21
Turns ON when data is written successfully to the 32-bit decimal type file
FNC 24 INC D28
Buffered data forcible writing execution counter.
RST M28
Turns ON when forcible writing of buffered data to the CF card is completed successfully.
FNC 230 LD= D28 K10
M8404 CF-ADP unit ready
M8405 CF card is mounted
FNC304 FLCMD K1 K1
The buffered data is forcibly written.
M8329 Abnormal end
RST D28
The buffered data forcible writing execution counter is reset.
FNC 12 MOV D8418 D108
The error code is stored.
FNC 12 MOV D8417 D109
The error code details are stored.
M8029 Execution completion
RST D28
The buffered data forcible writing execution counter is reset.
SET M28
Turns ON when forcible writing of buffered data to the CF card is completed successfully.
32-bit decimal data is read.
M2 Remains ON while data is being read from the 32-bit decimal type file
M8404 CF-ADP unit ready
M8405 CF card is mounted
FNC 12 MOV K3 D40
Specify the data reading type.
FNC 21 SUB D30 K1 D41
Specify the line position from which data is read. (Final line)
FNC 12 MOV K1 D42
Column position from which data is read.
FNC 12 MOV K10 D43
Number of read data points.
FNC303 FLRD K1 D40 D430 D50 K1
Data reading.
M8329 Abnormal end
RST M2
Remains ON while data is being read from the 32-bit decimal type file.
FNC 12 MOV D8418 D110
The error code is stored.
FNC 12 MOV D8417 D111
The error code details are stored.
M8029 Execution completion
RST M2
Remains ON while data is being read from the 32-bit decimal type file.
SET M22
Turns ON when data is read successfully from the 32-bit decimal type file.
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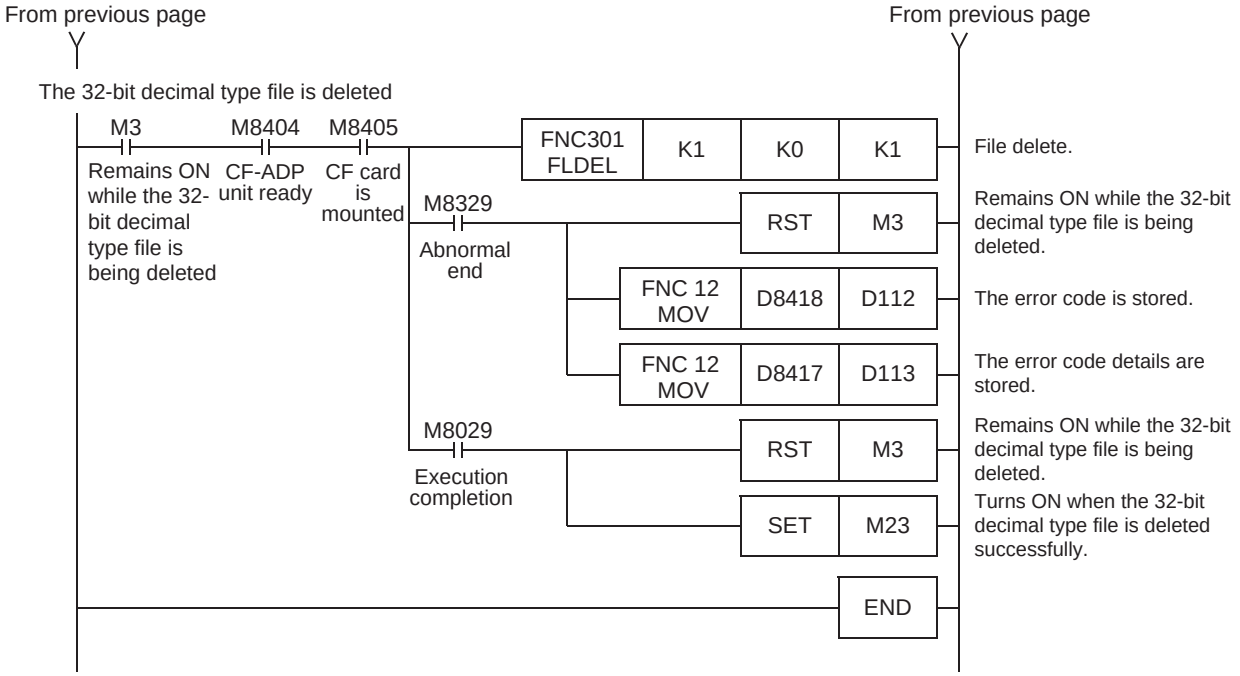
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The 32-bit decimal type file is deleted
M3
M8404
M8405
Remains ON while the 32-bit decimal type file is being deleted
CF-ADP unit ready
CF card is mounted
FNC301 FLDEL
K1
K0
K1
File delete.
M8329
Abnormal end
RST
M3
Remains ON while the 32-bit decimal type file is being deleted.
FNC 12 MOV
D8418
D112
The error code is stored.
FNC 12 MOV
D8417
D113
The error code details are stored.
M8029
Execution completion
RST
M3
Remains ON while the 32-bit decimal type file is being deleted.
SET
M23
Turns ON when the 32-bit decimal type file is deleted successfully.
END

9.3 Program Example 2

9.3.1 Operation details

- When X004 turns ON, the following file is created inside the CompactFlash™ card.
  If a file whose file ID is "0" already exists in the CompactFlash™ card, file creation and data name writing are aborted.
  "****" in "FILE****" below represents a numeric value from "0000" to "0999".
  - File ID = 0
  - File name = FILE****
  - Data type = Mixed
- When X005 turns ON, 7 data points of different types (bit type, 16-bit decimal type, 32-bit decimal type, 16-bit hexadecimal type, 32-bit hexadecimal type, real number and character string) are written directly and additionally to the file "FILE****" stored in the CompactFlash™ card.
- When X006 turns ON, 7 data points of different types are read from the final line in the file "FILE0000". Data reading should be executed after data writing.
- When X007 turns ON, the file "FILE****" is deleted.

9.3.2 Example of a mixed type file in "csv" format after writing

When a "csv" file is created and then data is written to the file 20 times, its contents are as shown below. Numeric values are stored in shaded areas.

Index	DATE TIME	Bit	DEC 16bit	DEC 32bit	HEX 16bit	HEX 32bit	Real number	Character string
1	2009/ 9/ 9 23:59:00	0	0	100000	FFFA	BBBBFFFA	1.00E+00	A
2	2009/ 9/ 9 23:59:02	1	1	200000	FFFB	BBBBFFFB	1.10E+00	AB
3	2009/ 9/ 9 23:59:04	1	2	300000	FFFC	BBBBFFFC	1.20E+00	ABC
4	2009/ 9/ 9 23:59:06	0	3	400000	FFFD	BBBBFFFD	1.30E+00	ABCD
5	2009/ 9/ 9 23:59:08	0	4	500000	FFFE	BBBBFFFE	1.40E+00	ABCDE
6	2009/ 9/ 9 23:59:10	1	5	600000	FFFF	BBBBFFFF	1.50E+00	ABCDEF
7	2009/ 9/ 9 23:59:20	1	6	700000	111A	AAAA111A	1.60E+00	ABCDEFG
8	2009/ 9/ 9 23:59:22	0	7	800000	111B	AAAA111B	1.70E+00	ABCDEFGH
9	2009/ 9/ 9 23:59:24	1	8	900000	111C	AAAA111C	1.80E+00	ABCDEFGHI
10	2009/ 9/ 9 23:59:26	0	9	1000000	111D	AAAA111D	1.90E+00	ABCDEFGHIJ
11	2009/ 9/ 9 23:59:28	1	10	2000000	111E	AAAA111E	1.11E+00	ABCDEFGHIJ
12	2009/ 9/ 9 23:59:30	0	20	3000000	111F	BBBB111F	1.12E+00	ABCDEFGHI
13	2009/ 9/ 9 23:59:32	1	30	4000000	222A	BBBB222A	1.13E+00	ABCDEFGH
14	2009/ 9/ 9 23:59:34	0	40	5000000	222B	BBBB222B	1.14E+00	ABCDEFG
15	2009/ 9/ 9 23:59:36	1	50	6000000	222C	BBBB222C	1.15E+00	ABCDEF
16	2009/ 9/ 9 23:59:38	0	60	7000000	222D	BBBB222D	1.16E+00	ABCDE
17	2009/ 9/ 9 23:59:40	1	70	8000000	222E	BBBB222E	1.17E+00	ABCD
18	2009/ 9/ 9 23:59:42	1	80	9000000	222F	BBBB222F	1.18E+00	ABC
19	2009/ 9/ 9 23:59:44	1	90	0	2222	BBBB2222	1.19E+00	AB
20	2009/ 9/ 9 23:59:46	0	100	100	3333	BBBB3333	1.21E+00	A

9.3.3 Device Assignments

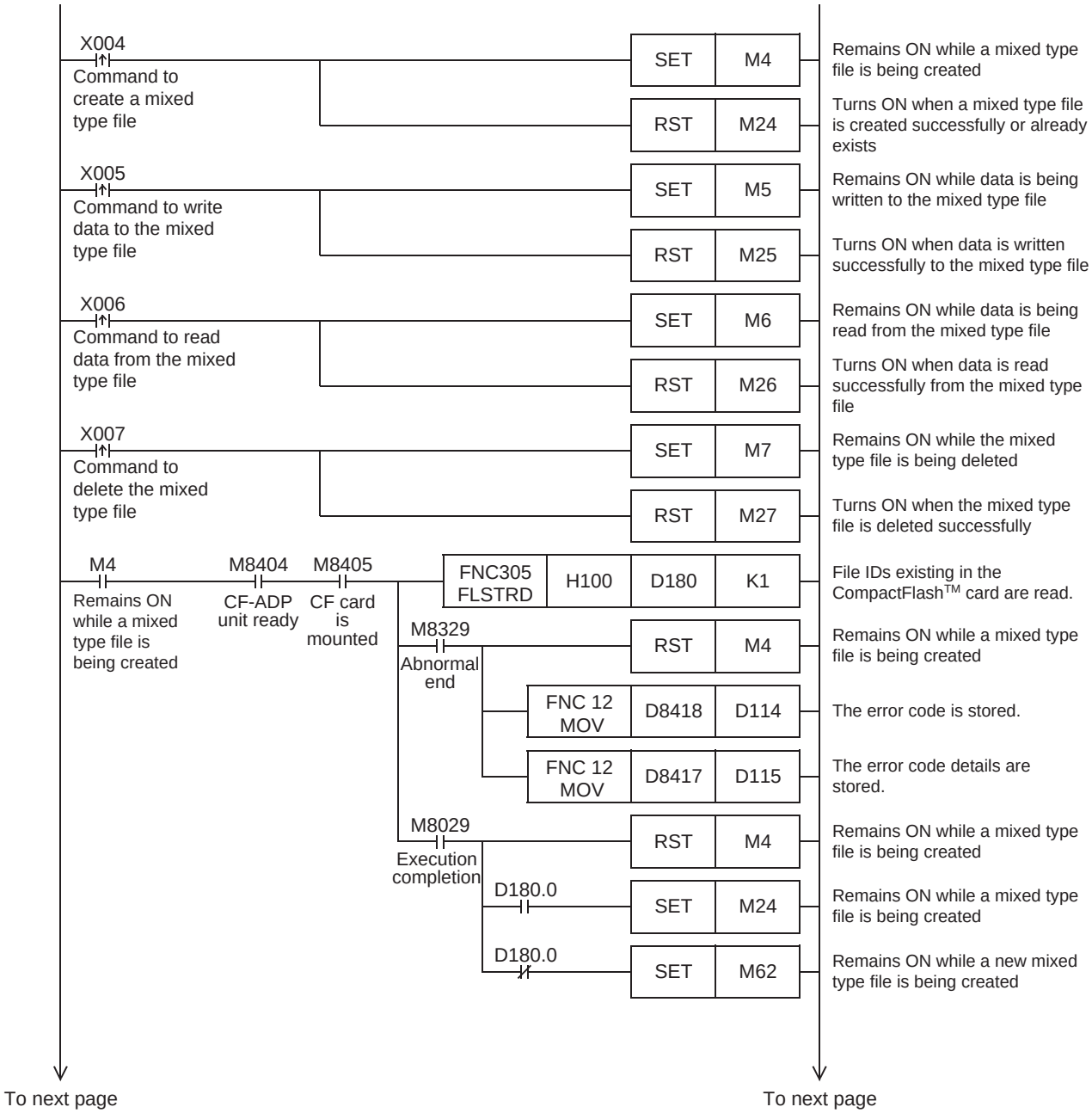
Device No.	Contents of operation
X004	Creates a mixed type file, and writes data names.
X005	Writes data to the mixed type file.
X006	Reads data from the mixed type file.

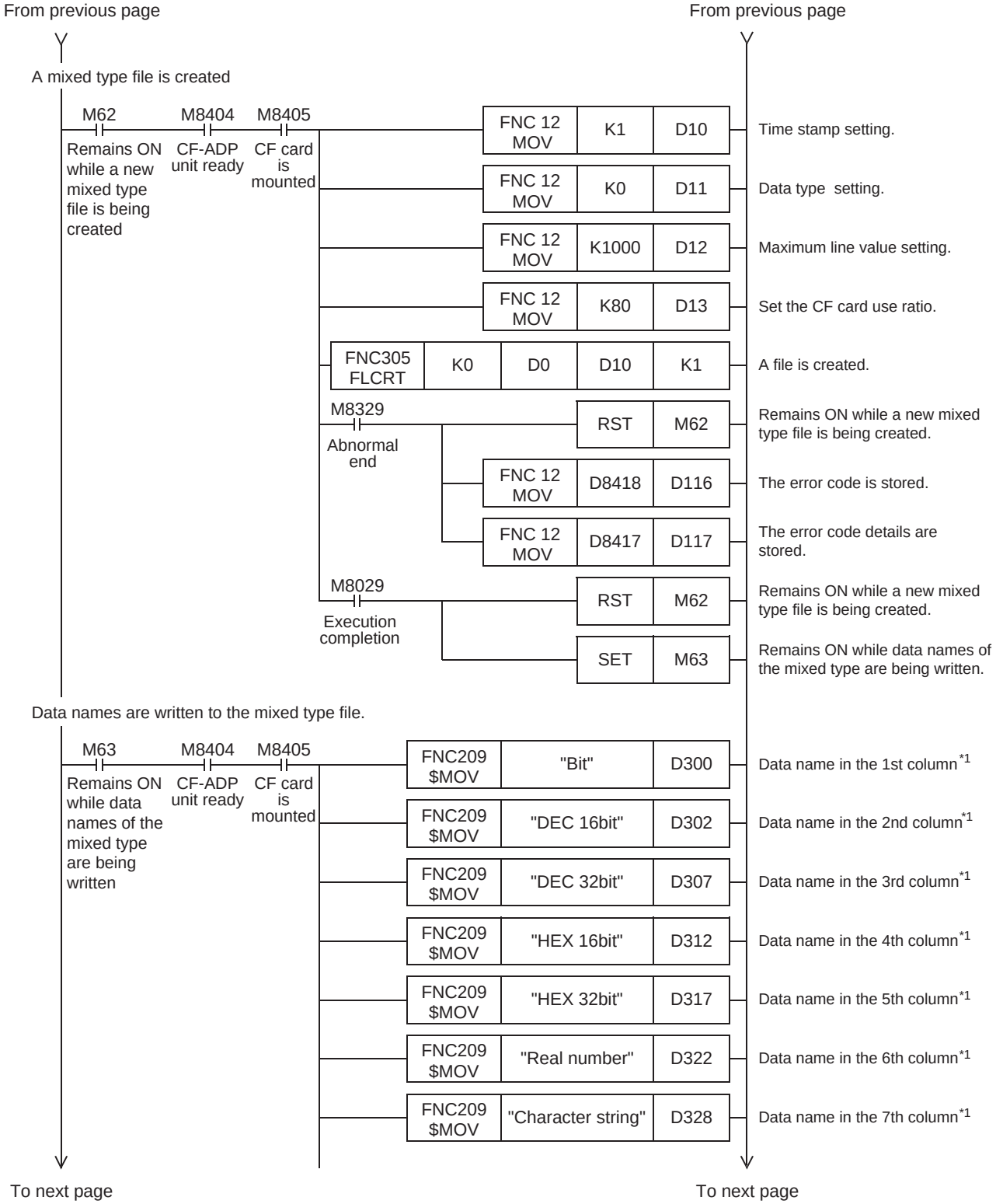
Device No.	Contents of operation
X007	Deletes the mixed type file.
M4	Remains ON while a mixed type file is being created.
M5	Remains ON while data is being written to the mixed type file.
M6	Remains ON while data is being read from the mixed type file.
M7	Remains ON while the mixed type file is being deleted.
M24	Turns ON when a mixed type file is created successfully or already exists.
M25	Turns ON when data is written successfully to the mixed type file.
M26	Turns ON when data is read successfully from the mixed type file.
M27	Turns ON when the mixed type file is deleted successfully.
M62	Remains ON while a new mixed type file is being created.
M63	Remains ON while data names of the mixed type are being written.
M200	Bit data written to the mixed type file.
M400	Bit data read from the mixed type file.
D0	File name (fixed to "FILE").
D10	Time stamp setting
D11	Data type
D12	Maximum Index value setting.
D13	Set the CompactFlash™ card use ratio.
D20	Specify the data writing type.
D21	Specify the Index value of the writing destination.
D22	Specify the data column position in the writing destination.
D23	Number of written data points.
D24	Writing destination. (CompactFlash™ card)
D30	Specify the line position of the writing destination.
D31	Specify the data column position in the writing destination.
D40	Specify the data reading type.
D41	Specify the line position from which data is read.
D42	Column position from which data is read.
D43	Number of read data points.
D50	Number of data points existing in the specified line
D114/D115	Error code/error code details when existence of a file whose file ID is "1" is confirmed
D116/D117	Error code/error code details when a mixed type file is created
D118/D119	Error code/error code details when data names are written to the mixed type file
D120/D121	Error code/error code details when data is written to the mixed type file
D122/D123	Error code/error code details when data is read from the mixed type file
D124/D125	Error code/error code details when the mixed type file is deleted
D180	File ID information read when the mixed type file is created
D300 to D336	Data name data written to the mixed type file
R0	16-bit decimal data written to the mixed type file
R11, R10	32-bit decimal data written to the mixed type file
R20	16-bit hexadecimal data written to the mixed type file
R31, R30	32-bit hexadecimal data written to the mixed type file
D41, R40	Real number data written to the mixed type file
R50 to R54	Character string data written to the mixed type file
R100	16-bit decimal data read from the mixed type file
R111, R110	32-bit decimal data read from the mixed type file
R120	16-bit hexadecimal data read from the mixed type file
R131, R130	32-bit hexadecimal data read from the mixed type file
R141, R140	Real number data read from the mixed type file
R150 to R159	Character string data read from the mixed type file

9.3.4 Sequence Program

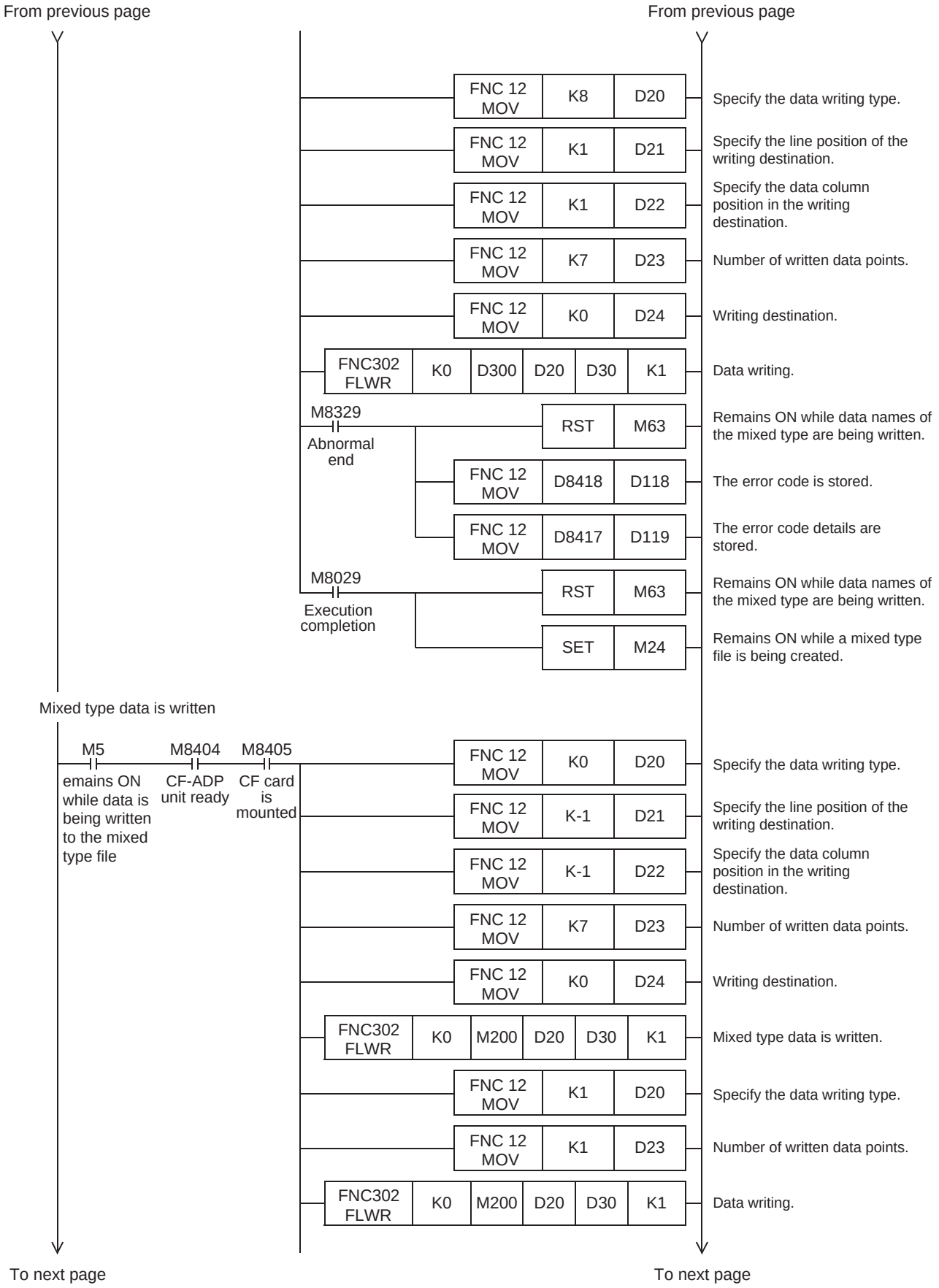
This program example describes the sequence program for channel 1 (ch1).
Rewrite the channel No. with the actual system configuration to be used.

→ **For explanation of operations, refer to Subsection 9.3.1.**
→ **For an example of a mixed type file in "csv" format after writing, refer to Subsection 9.3.2.**
→ **For device assignments, refer to Subsection 9.3.3.**





*1. When (S2•) is "K7" or "K8", 00H, which indicates the end of the string, must be added to the end of the character string. In addition, in sequence example, it is written in such a way that "00H" is placed in a blank area of a character string. When a character string is modified, it is necessary ensure that "00H" is placed at the end of the character string.


From previous page
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FNC 12 MOV K8 D20
Specify the data writing type.
FNC 12 MOV K1 D21
Specify the line position of the writing destination.
FNC 12 MOV K1 D22
Specify the data column position in the writing destination.
FNC 12 MOV K7 D23
Number of written data points.
FNC 12 MOV K0 D24
Writing destination.
FNC302 FLWR K0 D300 D20 D30 K1
Data writing.
M8329
Abnormal end
RST M63
Remains ON while data names of the mixed type are being written.
FNC 12 MOV D8418 D118
The error code is stored.
FNC 12 MOV D8417 D119
The error code details are stored.
M8029
Execution completion
RST M63
Remains ON while data names of the mixed type are being written.
SET M24
Remains ON while a mixed type file is being created.
Mixed type data is written
M5
emains ON while data is being written to the mixed type file
M8404
CF-ADP unit ready
M8405
CF card is mounted
FNC 12 MOV K0 D20
Specify the data writing type.
FNC 12 MOV K-1 D21
Specify the line position of the writing destination.
FNC 12 MOV K-1 D22
Specify the data column position in the writing destination.
FNC 12 MOV K7 D23
Number of written data points.
FNC 12 MOV K0 D24
Writing destination.
FNC302 FLWR K0 M200 D20 D30 K1
Mixed type data is written.
FNC 12 MOV K1 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 M200 D20 D30 K1
Data writing.
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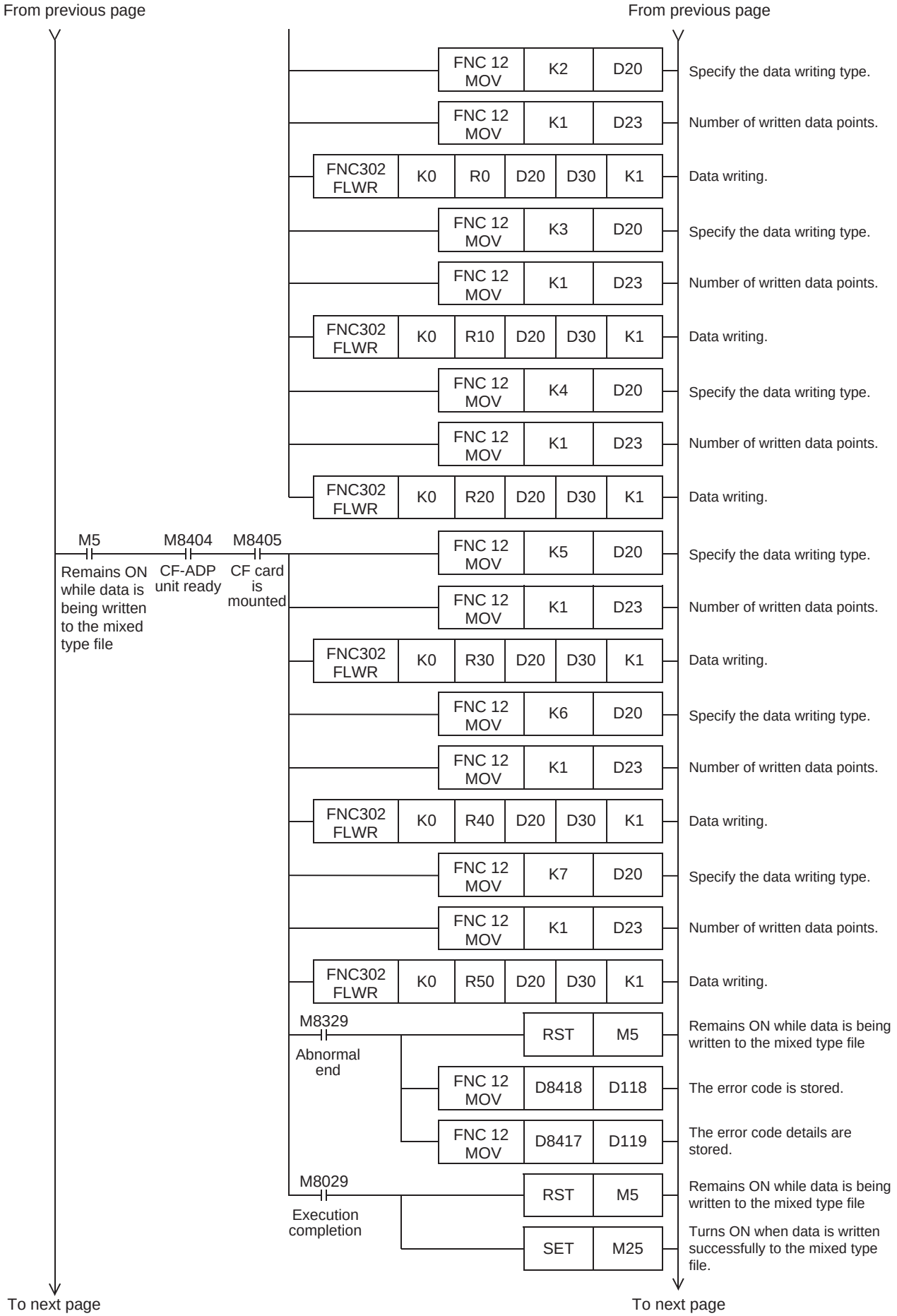
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FNC 12 MOV K2 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 R0 D20 D30 K1
Data writing.
FNC 12 MOV K3 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 R10 D20 D30 K1
Data writing.
FNC 12 MOV K4 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 R20 D20 D30 K1
Data writing.
M5
Remains ON while data is being written to the mixed type file
M8404
CF-ADP unit ready
M8405
CF card is mounted
FNC 12 MOV K5 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 R30 D20 D30 K1
Data writing.
FNC 12 MOV K6 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 R40 D20 D30 K1
Data writing.
FNC 12 MOV K7 D20
Specify the data writing type.
FNC 12 MOV K1 D23
Number of written data points.
FNC302 FLWR K0 R50 D20 D30 K1
Data writing.
M8329
Abnormal end
RST M5
Remains ON while data is being written to the mixed type file
FNC 12 MOV D8418 D118
The error code is stored.
FNC 12 MOV D8417 D119
The error code details are stored.
M8029
Execution completion
RST M5
Remains ON while data is being written to the mixed type file
SET M25
Turns ON when data is written successfully to the mixed type file.
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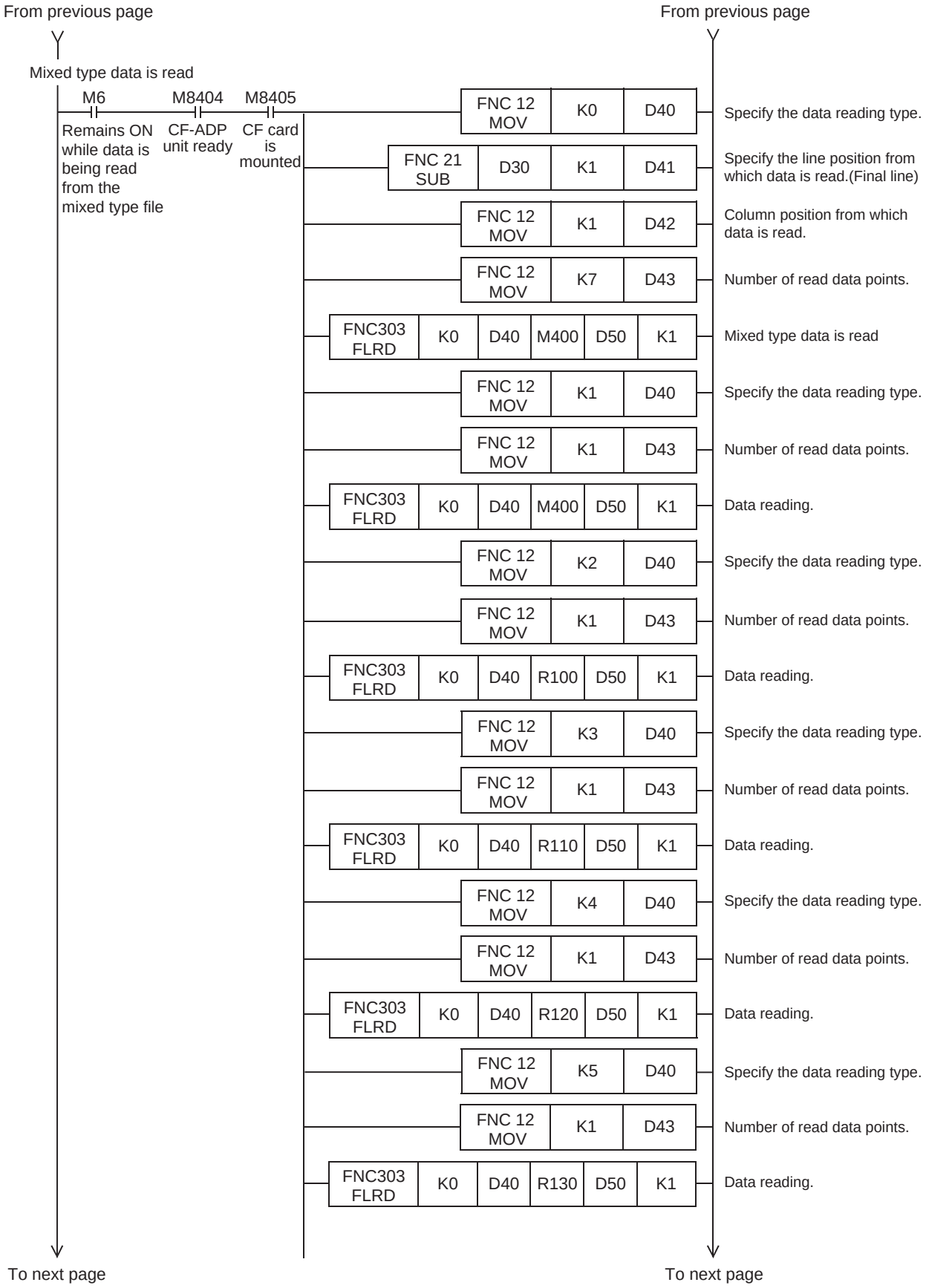
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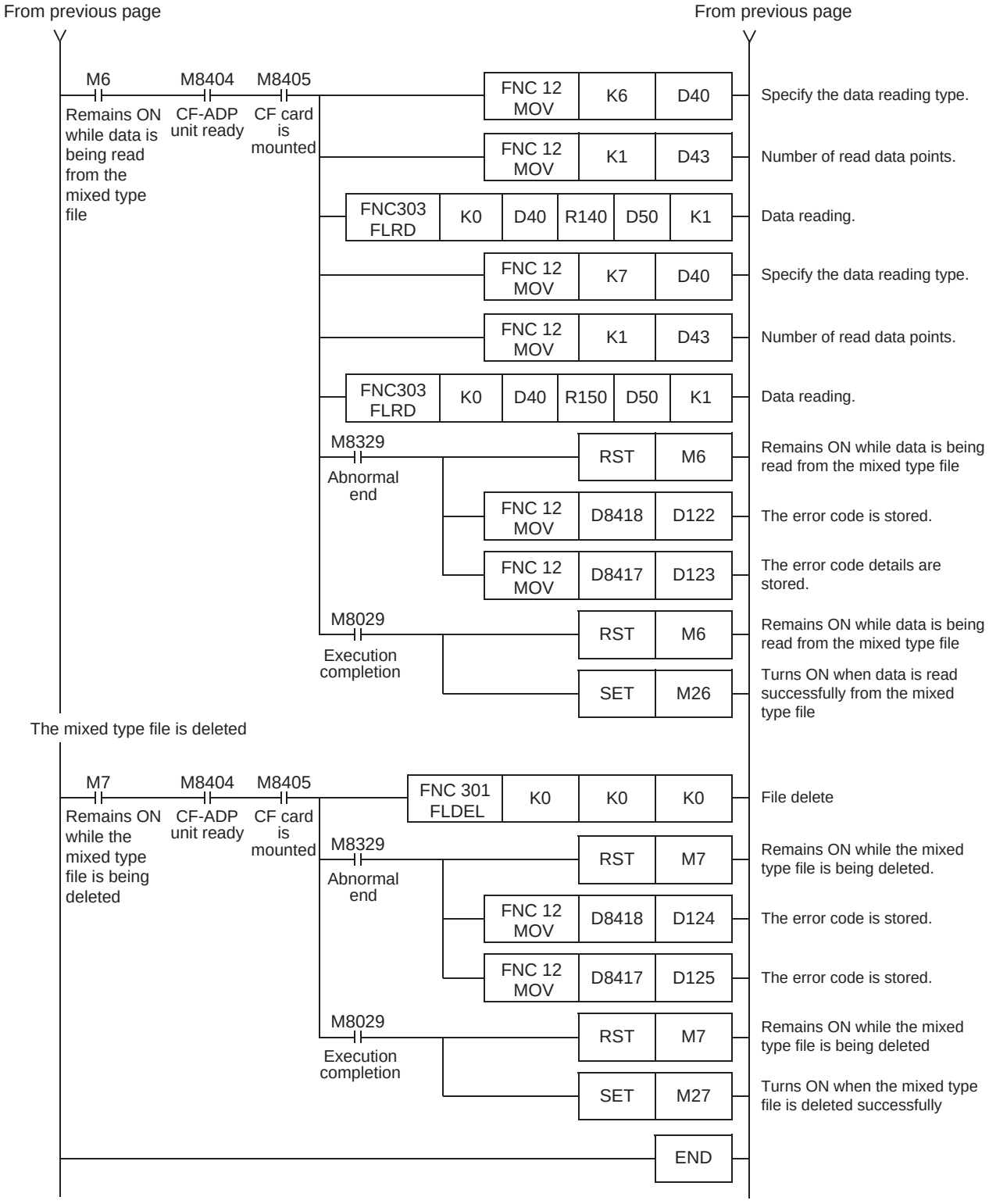
Mixed type data is read
M6
M8404
M8405
Remains ON while data is being read from the mixed type file
CF-ADP unit ready
CF card is mounted
FNC 12 MOV K0 D40
Specify the data reading type.
FNC 21 SUB D30 K1 D41
Specify the line position from which data is read.(Final line)
FNC 12 MOV K1 D42
Column position from which data is read.
FNC 12 MOV K7 D43
Number of read data points.
FNC303 FLRD K0 D40 M400 D50 K1
Mixed type data is read
FNC 12 MOV K1 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 M400 D50 K1
Data reading.
FNC 12 MOV K2 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 R100 D50 K1
Data reading.
FNC 12 MOV K3 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 R110 D50 K1
Data reading.
FNC 12 MOV K4 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 R120 D50 K1
Data reading.
FNC 12 MOV K5 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 R130 D50 K1
Data reading.
To next page
From previous page
To next page


From previous page
From previous page
M6
M8404
M8405
Remains ON while data is being read from the mixed type file
CF-ADP unit ready
CF card is mounted
FNC 12 MOV K6 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 R140 D50 K1
Data reading.
FNC 12 MOV K7 D40
Specify the data reading type.
FNC 12 MOV K1 D43
Number of read data points.
FNC303 FLRD K0 D40 R150 D50 K1
Data reading.
M8329
Abnormal end
RST M6
Remains ON while data is being read from the mixed type file
FNC 12 MOV D8418 D122
The error code is stored.
FNC 12 MOV D8417 D123
The error code details are stored.
M8029
Execution completion
RST M6
Remains ON while data is being read from the mixed type file
SET M26
Turns ON when data is read successfully from the mixed type file
The mixed type file is deleted
M7
M8404
M8405
Remains ON while the mixed type file is being deleted
CF-ADP unit ready
CF card is mounted
FNC 301 FLDEL K0 K0 K0
File delete
M8329
Abnormal end
RST M7
Remains ON while the mixed type file is being deleted.
FNC 12 MOV D8418 D124
The error code is stored.
FNC 12 MOV D8417 D125
The error code is stored.
M8029
Execution completion
RST M7
Remains ON while the mixed type file is being deleted
SET M27
Turns ON when the mixed type file is deleted successfully
END

9.4 Program Example 3

9.4.1 Operation details

When X010 turns ON, error codes, error code details, and error code information (error flag) of the CF-ADP are read.

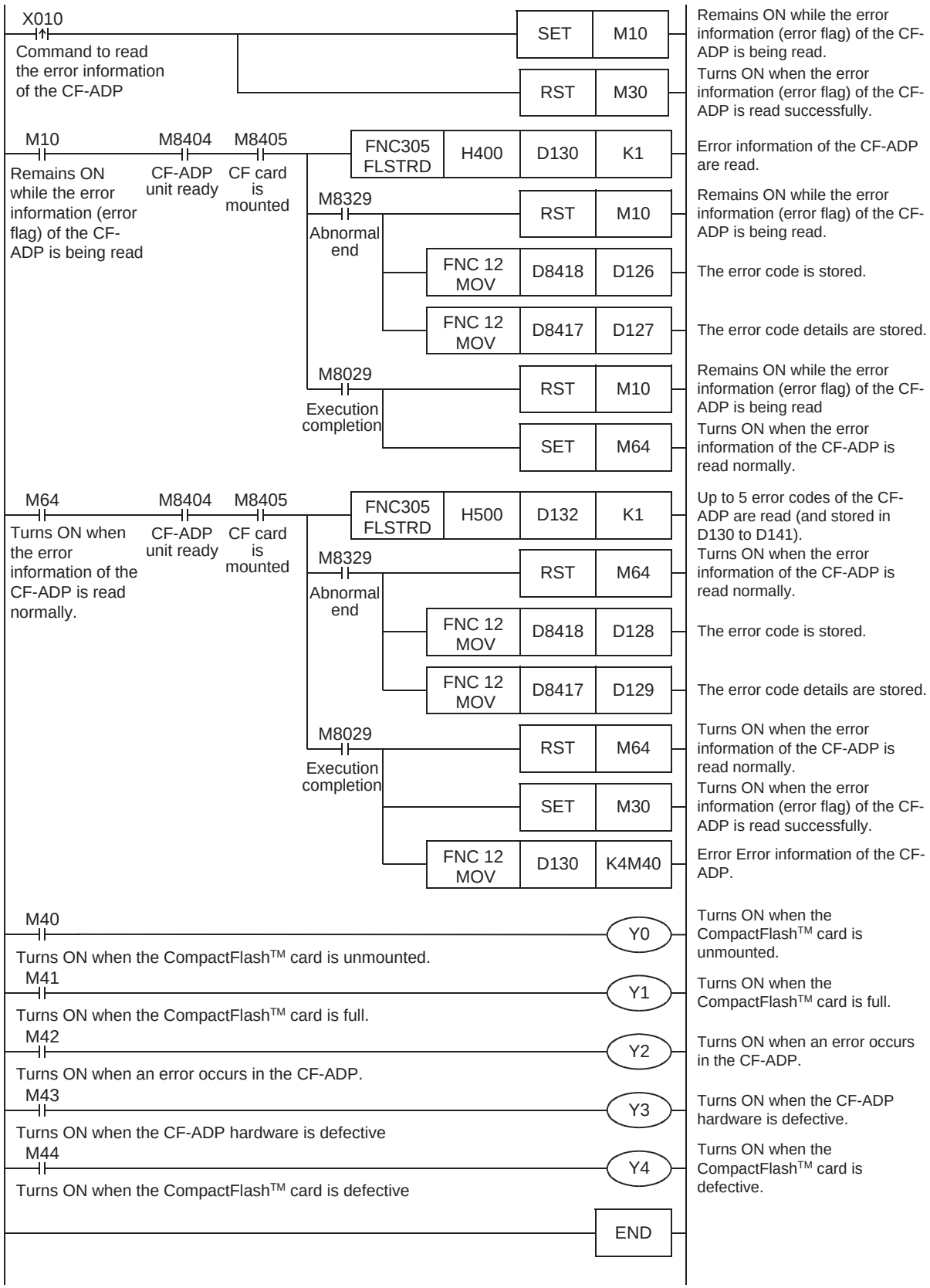
9.4.2 Device Assignments

Device No.	Contents of operation
X010	Reads error codes, error code details, and error code information (error flag) of the CF-ADP.
M10	Remains ON while the error information (error flag) of the CF-ADP is being read.
M30	Turns ON when the error information (error flag) of the CF-ADP is read successfully.
M40	Turns ON when the CompactFlash™ card is unmounted.
M41	Turns ON when the CompactFlash™ card is full.
M42	Turns ON when an error occurs in the CF-ADP.
M43	Turns ON when the CF-ADP hardware is defective
M44	Turns ON when the CompactFlash™ card is defective
M64	Turns ON when the error information of the CF-ADP is read normally.
D126/D127	Error code/error code details when the error information of the CF-ADP is read.
D128/D129	Error code/error code details when error codes of the CF-ADP are read.
D130	Error information (error flag) of the CF-ADP.
D132	Stores the error code 1 of the CF-ADP.
D133	Stores the error code details 1 of the CF-ADP.
D134	Stores the error code 2 of the CF-ADP.
D135	Stores the error code details 2 of the CF-ADP.
D136	Stores the error code 3 of the CF-ADP.
D137	Stores the error code details 3 of the CF-ADP.
D138	Stores the error code 4 of the CF-ADP.
D139	Stores the error code details 4 of the CF-ADP.
D140	Stores the error code 5 of the CF-ADP.
D141	Stores the error code details 5 of the CF-ADP.

9.4.3 Sequence Program

This program example describes the sequence program for channel 1 (ch1).
Rewrite the channel No. with the actual system configuration to be used.

→ **For explanation of operations, refer to Subsection 9.4.1.**
→ **For device assignments, refer to Subsection 9.4.2.**



10. Troubleshooting

INSTALLATION PRECAUTIONS DANGER

- Make sure to shut down all phases of the power supply externally before installing the FX3U-CF-ADP.
  Failure to do so may cause electric shock or damage to the product.

INSTALLATION PRECAUTIONS CAUTION

- Use the product within the generic environment specifications described in PLC main unit manual (Hardware Edition). Never use the product in areas with excessive dust, oily smoke, conductive dusts, corrosive gas (salt air, Cl_2, H_2S, SO_2, or NO_2), flammable gas, vibration or impacts, or expose it to high temperature, condensation, or rain and wind. If the product is used in such conditions, electric shock, fire, malfunctions, deterioration or damage may occur.
- Do not touch the conductive parts of the product directly.
  Doing so may cause device failures or malfunctions.
- Install the product securely using a DIN rail or mounting screws.
- Install the product on a flat surface.
  If the mounting surface is rough, undue force will be applied to the PC board, thereby causing nonconformities.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Be sure to remove the dust proof sheet from the PLC's ventilation port when installation work is completed.
  Failure to do so may cause fire, equipment failures or malfunctions.
- Connect the FX3U-CF-ADP securely to special adapter connector.
  Loose connections may cause malfunctions.
- Connect the power connector of the power supply cable securely to the CF-ADP power supply connector.
  Loose connections may cause malfunctions.
- When inserting a CompactFlash™ card into the FX3U-CF-ADP, push it into the CF card slot until the EJECT button pops out.
  Loose connections may cause malfunctions.
- Before inserting/removing a CompactFlash™ card into/from the FX3U-CF-ADP, set the CF card ACCESS switch to OFF and confirm that the BUFFER LED and ACCESS LED are both OFF.
  Failure to do so may corrupt data within the CompactFlash™ card.
- When removing a CompactFlash™ card from the FX3U-CF-ADP, make sure to support the CompactFlash™ card by hand, as it may pop out.
  Failure to do so may cause the CompactFlash™ card to fall from the FX3U-CF-ADP and break.
- Turn off the power to the PLC before attaching or detaching the following devices.
  Failure to do so may cause device failures or malfunctions.
  - Peripheral devices, display modules, expansion boards and special adapters
  - I/O extension units/blocks, FX Series terminal block and the special function units/blocks
  - Battery and memory cassette

WIRING PRECAUTIONS DANGER

- Make sure to cut off all phases of the power supply externally before attempting wiring work.
  Failure to do so may cause electric shock or damage to the product.

WIRING PRECAUTIONS CAUTION

- Connect the DC power supply wiring to the dedicated terminal described in this manual.
  If an AC power supply is connected to a DC input/output terminal or DC power supply terminal, the PLC will burn out.
- Connect the DC power supply wiring to the dedicated connector described in this manual.
  If an AC power supply is connected to a DC power supply connector, the PLC will burn out.
- When drilling screw holes or wiring, make sure that cutting and wiring debris do not enter the ventilation slits.
  Failure to do so may cause fire, equipment failures or malfunctions.

STARTUP AND MAINTENANCE PRECAUTIONS DANGER

- Make sure to connect the battery correctly. Do not charge, disassemble, heat, short-circuit, or expose the battery to fire.
  Doing so may rupture or ignite it.
- Do not touch any terminal while the PLC's power is on.
  Doing so may cause electric shock or malfunctions.
- Before modifying or disrupting the program in operation or running the PLC, carefully read through this manual and the associated manuals and ensure the safety of the operation.
  An operation error may damage the machinery or cause accidents.

STARTUP AND MAINTENANCE PRECAUTIONS CAUTION

- Do not disassemble or modify the PLC.
  Doing so may cause fire, equipment failures, or malfunctions.
  For repair, contact your local Mitsubishi Electric distributor.
- Turn off the power to the PLC before attaching or detaching the following devices.
  Failure to do so may cause device failures or malfunctions.
  - Peripheral devices, display modules, expansion boards and special adapters
  - I/O extension units/blocks, FX Series terminal block and the special function units/blocks
  - Battery and memory cassette

10.1 Troubleshooting procedure

10.1.1 LED status check

The table below describes details for LED statuses.

LED display	Color	Status	Description	Error corrective action
POWER	Green	OFF	Power is not being supplied from the external power supply (24V DC).	• Correctly connect the power cable. • Correctly connect the wiring to the external power supply. • When the service power supply of the PLC main unit is in use, make sure that the supply capacity is not being exceeded.
		ON	Power is being supplied from the external power supply (24V DC).	The power supply is normal.
BUFFER	Green	OFF	Data is not stored in the internal buffer.	-
		ON	Data is stored in the internal buffer.	-
ERR.	Red	OFF	No errors.	-
		ON	CF write error, CompactFlash™ card error, etc. has occurred.	An error has occurred in the CF-ADP. Check the error code, and perform the appropriate action according to the content of the error. For details on error codes, refer to the following. **→ Refer to Subsection 10.1.3**
FULL	Red	OFF	The CompactFlash™ card has free space.	-
		Flicker	The free space in the CompactFlash™ card is at 20% or less of the full capacity.	-
		ON	The CompactFlash™ card has no free space. The free space in the CompactFlash™ card is at 1% or less of the full capacity.	Delete unnecessary data, or replace the CompactFlash™ card.
ACCESS	Red	OFF	CompactFlash™ card not accessed	-
		ON	CompactFlash™ card being accessed	-
SLOT	Green	OFF	The CompactFlash™ card is not inserted, or the slot is in the CompactFlash™ card unmounted status.	The CompactFlash™ card is not inserted Insert a CompactFlash™ card.
		ON	The CompactFlash™ card is inserted, or the slot is in the card mounted status.	-

10.1.2 Troubleshooting by error code

When an error occurs, the PLC turns ON the special auxiliary relay M8329 (instruction execution abnormal end), and aborts execution of the instruction. After that, the PLC stores error codes in the special data register for error code storage, and turns ON the error flag.

1. Checking the error status by monitoring special data registers

Monitor the special data registers shown below to check the error code, error code details and step number where the error has occurred.

→ For details of error codes, refer to Subsection 10.1.3.

Error code storage device		Error code detail storage device		Error detected step number storage device	
ch1	ch2	ch1	ch2	ch1	ch2
D8418	D8438	D8417	D8437	D8415,D8414	D8435,D8434

2. Checking the error status by executing the FLSTRD instruction

Execute the FLSTRD instruction (FNC305 for the CF-ADP) to check the error code of the 5 latest errors.

→ For details of the instruction, refer to Chapter 8.

→ For details of error codes, refer to Subsection 10.1.3.

10.1.3 Error Code List and Action

The list below shows error codes and corrective actions.

1. Error code list

Error code	Error definition	Error corrective action
1	Parity, Framing, Overrun error	Check the connection to the CF-ADP.
2	Communication character error	
3	Communication SUM error	
4	Data format error	
5	Timeout error	
7	Frame format error	
8	Response error	Something may be wrong with mixed type instructions. Check the parameter contents, execution order, etc. in mixed type instructions.
9	Outside parameter device range	Check the parameter contents. The error code details store in which parameter the error has occurred.
12	The CF-ADP is being started up, or the power is OFF.	Check the power supply for the CF-ADP and its connection.
16	Command code error in mixed type specification	Something may be wrong with mixed type instructions. Check the parameter contents, execution order, etc. in mixed type instructions.
18	Outside channel number range in mixed type specification	
21	Outside 1st parameter range	The contents specified by the 1st parameter such as the file ID are outside the setting range.
22	Outside file ID range in mixed type specification	
23	File name error	Something is wrong with the file name.
24	File name length error	The file name exceeds 8 half-width characters.
25	Reserved word in file name	The file name contains unavailable reserved words. Reserved words "CON","PRN","AUX","CLOCK$","NUL","COM0","COM1", "COM2","COM3","COM4","COM5","COM6","COM7","COM8", "COM9","LPT0","LPT1","LPT2","LPT3","LPT4","LPT5", "LPT6","LPT7","LPT8","LPT9"
26	Outside line range	The line number is outside the setting range.
27	Outside line range in mixed type specification	The line number is outside the setting range. Something may be wrong with mixed type instructions. Check the parameter contents, execution order, etc. in mixed type instructions.
28	Outside column number range	The column number is outside the setting range.
29	Outside setting range of CompactFlash™ card utilization/operation when the maximum line number has been reached	The CompactFlash™ card utilization or operation when the maximum Index value has been reached is outside the setting range.
30	Outside time stamp setting range	The time stamp is outside the setting range.
31	Outside data format specification range	The data format is outside the setting range.
32	Data format error in mixed type specification	The data format is incorrect. Something may be wrong with mixed type instructions. Check the parameter contents, execution order, etc. in mixed type instructions.
33	Data name writing error while a mixed type instruction is being executed	It is possible that data name was written while a mixed type instruction was being executed. Check the parameter contents, execution order, etc. in mixed type instructions.
34	FLDEL instruction format specification error	Parameters in the FLDEL instruction are outside the setting range.
35	Device range error	Devices specified by parameters are outside the setting range.
36	Device point number range error	The number of written points/read points specified by the parameter is outside the setting range.

Error code	Error definition	Error corrective action
37	Outside device point number range in mixed type specification	The number of written points/read points specified by the parameter is outside the setting range. Something may be wrong with mixed type instructions. Check the parameter contents, execution order, etc. in mixed type instructions.
38	Mixed type instruction execution error	The number of written/read points specified by the parameter is outside the setting range. Check the parameter contents, execution order, etc. in mixed type instructions.
42	Response device type error	
43	Frame number error	
46	Too many characters	The character string exceeds 512 full-width characters, or the data name exceeds 32 full-width characters.
200	System error	Something may be wrong with the hardware. Contact your local Mitsubishi Electric distributor.
201	Power shutdown history reading error	Check whether a CompactFlash™ card having sufficient free space is mounted correctly. When a CompactFlash™ card is mounted correctly, something may be wrong with the hardware. Contact your local Mitsubishi Electric distributor.
202	Power shutdown history writing error	
203	Power shutdown history corruption	
204	Power shutdown history backup error	
205	System error	Something may be wrong with the hardware. Contact your local Mitsubishi Electric distributor.
206	Power shutdown detection	Shutdown of the supply voltage is detected. Check whether the power is supplied correctly.
300	SDRAM error	Something may be wrong with the hardware. Contact your local Mitsubishi Electric distributor.
301	ROM error	
302	EPROM error	
303	SRAM error	
304	SUM check error	
400	CompactFlash™ card unmounted error	The CompactFlash™ card is not mounted in the CompactFlash™ card slot. Mount the CompactFlash™ card correctly in the CompactFlash™ card slot.
401	CompactFlash™ card error	The CompactFlash™ card may be defective. Replace the CompactFlash™ card with another one.
402	CompactFlash™ card mount error	The CompactFlash™ card is not formatted correctly. Format the CompactFlash™ card, or replace it with another one.
404	CF free space acquisition error	The CompactFlash™ card may be defective. Format the CompactFlash™ card, or replace it with another one.
405	CF FULL	The CompactFlash™ card is full. Delete unnecessary data, or replace the CompactFlash™ card with another one.
406	Directory creation error	A folder was not able to be created in the CompactFlash™ card. Check whether the number of files and folders in the root directory in the CompactFlash™ card does not exceed 512. Check whether the CompactFlash™ card is formatted, and whether it is ready for data writing.
407	CompactFlash™ card format error	The CompactFlash™ card is not formatted correctly. Check whether the CompactFlash™ card is mounted correctly. Format the CompactFlash™ card, or replace it with another one.
500	Line file error	Access to the file management information file has failed. Check whether the CompactFlash™ card is mounted correctly.
501	ID table open error	The file management information was not able to be read from the CompactFlash™ card. When reading or deleting a file, confirm that the target file exists.
502	ID table write error	The file management information was not able to be created in the CompactFlash™ card. Check whether the CompactFlash™ card is ready for data writing.

Error code	Error definition	Error corrective action
503	ID table read error	The file management information was not able to be read from the CompactFlash™ card. When reading or deleting a file, confirm that the target file exists.
504	ID table corruption error	The file management information is corrupt.
505	ID table not found	The file management information does not exist in the CompactFlash™ card.
600	Parity, Framing, Overrun error	Check the connection to the main unit.
601	Communication character error	
602	Communication sum error	
603	Outside channel number range	Check the version of the main unit. Something may be wrong with the hardware. Contact your local Mitsubishi Electric distributor.
604	Undefined command error	
605	Time check error	
606	Address error inside adapter	
607	Consecutive execution serial number error	
608	Consecutive execution serial number error (serial number)	
609	Outside data type range	The data type specified during file creation is different from the data type to be written.
610	Outside transfer point number range	Check the version of the main unit. Something may be wrong with the hardware. Contact your local Mitsubishi Electric distributor.
611	Total transfer point number error	
612	Transfer point number error, minimum value error or maximum value error in each type	
613	Outside single type or mixed type command range	
614	Mixed type data in single type command	
615	Mismatch between total number of points and sum of number of points of each type	
616	Deletion method error	
617	Outside FAT format range	
619	Outside error code clear command range	
620	Divided character string receiving error	
700	Command execution error	
701	Command sequence error	
702	Data name not set in head record	The data name can be written only in the head line. Check whether data does not exist in the writing target file.
703	ACCESS switch OFF error	Check whether the ACCESS switch is set to ON.
704	Access error in unmounted status	Check whether the SLOT LED or M8405/M8425 (CF card mounting status) is ON. If the SLOT LED or M8405/M8425 is OFF, pull out the CompactFlash™ card once and insert it again, or execute CompactFlash™ card mounting processing. Confirm that the SLOT LED or M8405/M8425 turns ON, and then execute the instruction again.
801	File ID specification error	The specified file ID does not exist. Check whether the specified file ID has been used.
802	CF file ID number error	The specified file ID is outside the setting range. Specify the file ID within the range from 0 to 63.
803	CF file ID duplication error	The specified file ID already exists. If the specified file already exists, the same file cannot be created or confirmed because parameters set at file creation are changed. When the file has already been created, confirm the parameters. When the file has not been created yet, delete the existing file or specify another file ID.
804	Existing file line position larger than specified maximum line position	The maximum line position of the target file to be associated is larger than the maximum line position of the file specified in the file creation instruction. Review the maximum line position in the file creation instruction.

Error code	Error definition	Error corrective action
805	Outside data line position range	Data cannot be written to the line position specified in the file writing instruction. Specify line position smaller than "Index value existing in the file +1" or "Maximum line position specified in the file creation instruction".
806	Specified data line position not found in file	The line position specified in the file reading instruction does not exist in the file. Specify line position existing in the file.
807	CF file name duplication error	The file specified in the file creation instruction already exists. Specify another file name.
808	CF file name length error	In the file creation instruction, specify the file name within 8 characters.
809	CF file name character error	The file name specified in the file creation instruction contains unavailable characters. Review the file name.
810	CF file time stamp error	The time stamp format specified in the file creation instruction is outside the setting range. Review the specified value.
811	CF file maximum line position error	The maximum line position specified in the file creation instruction is outside the setting range. Review the specified value.
812	CF file information number error	The maximum line position, file processing when the maximum line position is reached or CompactFlash™ card utilization of FIFO files specified in the file creation instruction is outside the setting range. Review the specified value.
813	File data type error	The data type specified in the file creation instruction is outside the setting range. Review the specified value.
815	Outside column position range	The column position specified in the file writing/reading instruction is outside the setting range. Review the specified value.
817	Plural data types specified in mixed type file	Data of multiple data types was attempted to be read from a file for which a type other than mixed type is specified in the file creation instruction. Review the data type in the existing file, or data type to be read.
818	Outside line position range	The file specified in the file writing instruction has already reached the maximum line position, and will not accept any more additional writing. Delete the file, or specify another file.
900	Line search error	The specified line is not found in the file. Check whether the file is corrupt, and whether its contents agree with the specification. Check whether the file contains a line larger than the maximum line position specified in the file creation instruction.
901	File reading error	Data was not read correctly from the file. Check whether the file is corrupt, and whether its contents agree with the specification.
902	File writing error	Data was not written correctly to the file. Check whether the CompactFlash™ card is mounted correctly, whether the CompactFlash™ card is full, and whether the CompactFlash™ card is ready for data writing.
903	File creation error	The file was not created correctly. Check whether the CompactFlash™ card is full, and whether the CompactFlash™ card is ready for data writing.
905	File deletion error	The file was not deleted correctly. Check whether the deletion target file is ready for deletion.
906	File opening error	The file was not open correctly. Check whether the CompactFlash™ card is mounted correctly, and whether the file is ready for opening.
908	FIFO file creation error	A FIFO file was not able to be created. Check whether the CompactFlash™ card is mounted correctly, and whether the CompactFlash™ card utilization specified in the file creation instruction is exceeded.

Error code	Error definition	Error corrective action
909	Buffered data writing error to CompactFlash™ card	Buffered data was not able to be written to the CompactFlash™ card. Check whether the CompactFlash™ card is mounted correctly, and whether it has sufficient free space. In the case of FIFO file, check whether the CompactFlash™ card utilization specified in the file creation instruction is not exceeded.
1000	Specified column position not found in data	The column position specified for overwriting in the file writing instruction does not exist in the overwriting target data. Review the specified column position.
1001	Data reading error	Data was not read correctly from the line position specified in the file reading instruction. Check the contents of the file, and the data type specified in the file reading instruction.
1002	Data type mismatch	Target data was attempted to be overwritten with data of a different type in the file writing instruction. Or the file contains data whose type is different from the type of data to be read specified in the data reading instruction. Check the contents of the file, and the data type specified in the file writing instruction.
1003	Data not found	The data specified in the file reading instruction does not exist in the file. Check whether the data specified in the file reading instruction exists in the file.
1004	Character string size error	The character string exceeds 512 full-width characters, the data name exceeds 32 full-width characters, or the total size of one line exceeds 16 kB.

10.2 Diagnostics on the PLC Main Unit

The following describes some of the PLC errors from the LED lights on the PLC.
For details related to the PLC main unit wiring, special auxiliary relays, and special data registers, refer to the following respective manuals.

→ **Refer to the FX3U Hardware Edition**
→ **Refer to the FX3UC Hardware Edition**

10.2.1 POWER(POW) LED [on/flashing/off]

The table below describes details for the LED statuses.

Status	PLC Status	Error corrective action
ON	Power of the specified voltage is being supplied to the power supply terminal.	The power supply is normal.
Flicker	One of the following causes may have occurred. • Power and current of the specified voltage is not being supplied to the power supply terminal. • Incorrect external wiring. • Internal errors in the PLC.	• Check the supply voltage. • After disconnecting cables other than the power cable, turn the power ON again, and check for changes in the state. If no improvement is obtained, consult a Mitsubishi Electric distributor.
OFF	One of the following causes may have occurred. • The power supply is OFF. • Incorrect external wiring. • Power of the specified voltage is not being supplied to the power supply terminal. • The power cable is broken.	• If the power is not OFF, check the power supply and the power supply route. If power is being supplied correctly, consult a Mitsubishi Electric distributor. • After disconnecting cables other than the power cable, turn the power ON again, and check for changes in the state. If no improvement is obtained, consult a Mitsubishi Electric distributor.

10.2.2 BATT(BAT) LED [on/off]

The table below describes details for the LED statuses.

Status	PLC Status	Error corrective action
ON	The battery voltage is low.	Immediately replace the battery.
OFF	The battery voltage is higher than the value with D8006.	Normal

10.2.3 ERROR(ERR) LED [on/flashing/off]

The table below describes details for the LED statuses.

Status	PLC Status	Error corrective action
ON	A watchdog timer error may have occurred, or the hardware of the PLC may be damaged.	1) Stop the PLC, and turn the power ON again. If the ERROR(ERR) LED goes out, a watchdog timer error may have occurred. Adopt any of the following measures: - Review the program. Set the maximum value (D8012) lower than the watchdog timer value. - Check that the input used for input interrupt or pulse catch is not being abnormally turned ON and OFF in one scan. - Check that the frequency of the pulse (duty 50%) input to the high-speed counter is not exceeding the specified range. - Add WDT instructions. Add some WDT instructions to the program, and reset the watchdog timer several times in one scan. - Change the watchdog timer value. Change the watchdog timer setting (D8000) in the program so that the setting is larger than the maximum value of the scan time (D8012). 2) Remove the PLC and supply the power to it from another power source. If the ERROR(ERR) LED goes out, noise may have affected the PLC. Adopt the following measures: - Check the ground wiring, and re-examine the wiring route and installation location. - Fit a noise filter onto the power supply line. 3) If the ERROR(ERR) LED does not go out even after measures in 1) and 2) are adopted, consult a Mitsubishi Electric distributor.
Flicker	One of the following errors has occurred on the PLC: • Parameter error • Syntax error • Ladder error	Perform PLC diagnosis and program check with the programming tool.
OFF	No errors to stop the PLC have occurred.	If the operations of the PLC are abnormal, perform PLC diagnosis and program check with the programming tool. An I/O error, parallel link/communication error, or operation error may have occurred.

Appendix A: Related Devices

Appendix A-1 Related Device List

The tables below show special auxiliary relays and special data registers used in CF-ADP instructions (FNC300 (FLCRT) to FNC305 (FLSTRD)).

1. Special auxiliary relays

R: Read only W: Write only R/W: Read or Write

Device		Name	Description	R/W
ch1	ch2			
M8029		Instruction execution complete	Turns ON when the execution of CF-ADP instructions is completed, and remains ON for 1 scan.	R
M8329		Instruction execution abnormal end	Turns ON when the execution of CF-ADP instructions has ended abnormally, and remains ON for 1 scan.	R
M8067		Operation error	Turns ON when an operation error occurs.	R
M8402	M8422	CF-ADP instruction executing	Remains ON while an instruction for the CF-ADP is being executed.	R
M8404	M8424	CF-ADP unit ready	Remains ON when the CF-ADP is ready for receiving commands.	R
M8405	M8425	CF card mount status	ON : CompactFlash™ card mounted status OFF : CompactFlash™ card unmounted status	R
M8410	M8430	CF-ADP status renewal stop	Stops communication executed by the system to update the status of special data registers (D8406 and D8426).*2	R/W
M8418	M8438	CF-ADP instruction error*1	Turns ON when an error occurs in an instruction for the CF-ADP.	R/W

*1. Cleared when the PLC mode is changed from STOP to RUN.

*2. When an instruction for the CF-ADP is driven while the system is updating the status of special data registers, execution of the instruction for the CF-ADP may be delayed by several scans. If this delay is regarded as a problem, use this flag to stop the updating of the status.

2. Special data registers

R: Read only W: Write only R/W: Read or Write

Device		Name	Description	R/W
ch1	ch2			
D8067		Error code for operation error	Stores the error code when an operation error occurs.	R
D8402 D8403	D8422 D8423	Step number of executing CF-ADP instruction*1	Stores the step number of an instruction for the CF-ADP.	R
D8406	D8426	CF-ADP status	Stores the status information of the CF-ADP.	R
D8408	D8428	CF-ADP version	Stores the version of the CF-ADP.	R
D8414 D8415	D8434 D8435	Error step number of M8418, Error step number of M8438*1	Stores the step number of an instruction for the CF-ADP where an error occurs.	R
D8417	D8437	Error code in detail for CF-ADP instructions*1	Stores error code details when an error occurs in an instruction for the CF-ADP.	R
D8418	D8438	Error code for CF-ADP instructions*1	Stores the error code when an error occurs in an instruction for the CF-ADP.	R
D8419	D8439	Operation mode display	Stores the communication function status being executed.	R

*1. Cleared when the PLC mode is changed from STOP to RUN.

Appendix A-2 Details of related devices

This section explains devices used during CF-ADP.

Appendix A-2-1 Instruction execution complete [M8029]

When execution of CF-ADP instructions is completed, this device turns ON.

1. **Detailed contents**
   When execution of CF-ADP instructions is completed, M8029 turns ON, and remains ON for 1 scan.

2. **Cautions on use**
   M8029 is used as the instruction execution complete flag for other instructions (such as positioning instructions).
   When using M8029, place the contact just under the instruction whose execution completion is to be checked.

Appendix A-2-2 Instruction execution abnormal end [M8329]

When execution of CF-ADP instructions has ended abnormally, this device turns ON.

1. **Detailed contents**
   When execution of CF-ADP instructions is has ended abnormally, M8329 turns ON, and remains ON for 1 scan.

2. **Cautions on use**
   M8329 is used as the instruction execution abnormal end flag for other instructions.
   When using M8329, place the contact just under the instruction whose instruction execution abnormal end is to be checked.

Appendix A-2-3 CF-ADP instruction executing [M8402, M8422]

When an instruction for the CF-ADP is executed, one of these devices turns ON.

1. **Detailed contents**
   When an instruction for the CF-ADP is executed and communication with the CF-ADP starts, one of these devices turns ON.
   When communication port ch1 is used, M8402 turns ON.
   When communication port ch2 is used, M8422 turns ON.
   The CF-ADP instruction executing flag (M8402 or M8422) turns ON, and D8403 and D8402 (or D8423 and D8422) store the step number of the instruction which is using the communication port.

2. **Cautions on use**
   While the CF-ADP instruction executing flag (M8402 or M8422) remains ON, another instruction for the CF-ADP cannot be executed.

Appendix A-2-4 CF-ADP unit ready [M8404, M8424]

When the CF-ADP is ready for receiving commands, one of these devices remains ON.

1. **Detailed contents**
   These devices indicate whether the CF-ADP is ready for operation.
   When the CF-ADP becomes ready for operation, one of these devices automatically turns ON.
   When communication port ch1 is used, M8404 turns ON.
   When communication port ch2 is used, M8424 turns ON.

Appendix A-2-5 CF card mount status [M8405, M8425]

These devices indicate the CompactFlash™ card status.

1. Detailed contents

When the CompactFlash™ card is mounted, one of these devices turns ON.
When communication port ch1 is used, M8405 turns ON.
When communication port ch2 is used, M8425 turns ON.

Appendix A-2-6 CF-ADP status renewal stop [M8410, M8430]

Stops the communication executed by the system to update the status of special data registers (D8406 and D8426).

1. Detailed contents

Stops the communication executed by the system to update the status of special data registers (D8406 and D8426).*1
When communication port ch1 is used, M8410 turns ON.
When communication port ch2 is used, M8430 turns ON.

*1. When an instruction for the CF-ADP is driven while the system is updating the status of special data registers, execution of the instruction for the CF-ADP may be delayed by several scans. If this delay is regarded as a problem, use this flag to stop updating of the status.

Appendix A-2-7 CF-ADP instruction error [M8418, M8438]

These devices turn ON when an error occurs in an instruction for the CF-ADP.

1. Detailed contents

These devices indicate that an error occurs in an instruction for the CF-ADP.
When communication port ch1 is used, M8418 turns ON.
When communication port ch2 is used, M8438 turns ON.
When either of these devices turns ON, D8418 or D8438 stores the error code.

2. Cautions on use

These devices do not turn OFF even if the next instruction is completed normally.
Cleared when the PLC mode is changed from STOP to RUN.

Appendix A-2-8 CF-ADP status [D8406, D8426]

These devices store the status information of the CF-ADP.

1. Detailed contents

These devices store the status information of the CF-ADP as "ON" or "OFF" of b0 to b15.

Bit No.	Description
b0	An error has occurred in the CF-ADP.
b1 to b15	Not applicable

Appendix A-2-9 CF-ADP version [D8408, D8428]

These devices store the version information of the CF-ADP.

1. Detailed contents

These devices store the version information of the CF-ADP.
When communication port ch1 is used, D8408 stores the value.
When communication port ch2 is used, D8428 stores the value.

Appendix A-2-10 Step number of an instruction for the CF-ADP where an error has occurred [D8415, D8414][D8435, D8434]

These devices store the step number of an instruction for the CF-ADP where an error has occurred.

1. Detailed contents

These devices store the step number of an instruction for the CF-ADP where an error has occurred.
When communication port ch1 is used, (D8415, D8414) stores the value.
When communication port ch2 is used, (D8435, D8434) stores the value.
If an error has occurred in two or more instructions, these devices store the step number of the instruction for the CF-ADP where an error occurred first.
If no error has occurred, these devices store "-1".

2. Cautions on use

These devices store 32-bit data.

Appendix A-2-11 Error code in detail for CF-ADP instructions [D8417, D8437]

These devices store error code details when an error is caused by an instruction for the CF-ADP.

1. Detailed contents

These devices store error code details of an error caused by an instruction for the CF-ADP.
When communication port ch1 is used, D8417 stores the value.
When communication port ch2 is used, D8437 stores the value.

2. Error codes

For error codes, refer to Chapter 10.

Appendix A-2-12 Error code for CF-ADP instructions [D8418, D8438]

These devices store the error code when an error is caused by an instruction for the CF-ADP.

1. Detailed contents

These devices store the error code of an error caused by an instruction for the CF-ADP.
When communication port ch1 is used, D8418 stores the value.
When communication port ch2 is used, D8438 stores the value.

2. Error codes

For error codes, refer to Chapter 10.

Appendix A-2-13 Operation mode display [D8419, D8439]

These devices store the communication type being used.

1. Detailed contents

These devices store the code of the communication type currently being used in the communication port.
D8419 stores the communication type code currently used in communication port ch1.
D8439 stores the communication type code currently used in communication port ch2.
The table below shows the details of the codes.

Code	Description
0	Programming communication
1	Programming communication (PP modem mode)
2	Protocol dedicated to computer link
3	N:N Network
4	RS instruction
5	RS2 instruction
6	Parallel link
7	Inverter instruction
10	CF-ADP instruction

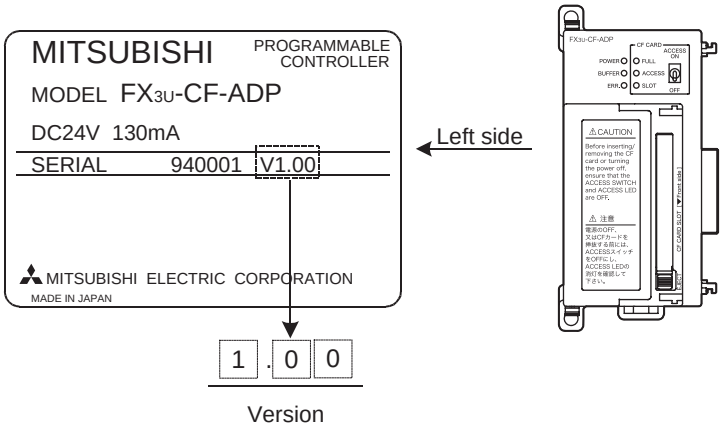
Appendix B: Version Information

Appendix B-1 Version information

Appendix B-1-1 Version check method

1. Checking the nameplate

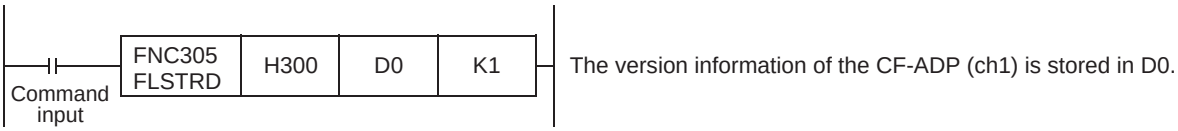
The CF-ADP version is indicated by "SERIAL" on the label attached to the left side of the module when viewed from the front.



2. Checking the CF-ADP instruction

In CF-ADP, users can obtain the CF-ADP version information by FLSTRD instruction.

Program Example



3. Checking the special data register

In CF-ADP, users can obtain the CF-ADP version information by monitoring special data register D8408(ch1)/ D8428(ch2) (decimal number).

Appendix B-1-2 Version upgrade history

The table below shows the version upgrade history for the CF-ADP.

Version	Contents of version upgrade
Ver.1.00	First product

MEMO

Warranty

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company. However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
   a) Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
   b) Failure caused by unapproved modifications, etc., to the product by the user.
   c) When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
   d) Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
   e) Relay failure or output contact failure caused by usage beyond the specified Life of contact (cycles).
   f) Failure caused by external irresistible forces such as fires or abnormal voltages, and failure caused by force majeure such as earthquakes, lightning, wind and water damage.
   g) Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
   h) Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
   Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user or third person by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
2) The Mitsubishi programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable logic controller applications.
   In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable logic controller range of applications.
   However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

Revised History

Date	Revision	Description
6/2009	A	First Edition

FX3U-CF-ADP

USER'S MANUAL

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
HIMEJI WORKS: 840, CHIYODA CHO, HIMEJI, JAPAN

MODEL	FX3U-CF-ADP-U-E
MODEL CODE	09R720

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(MEE)

Effective June 2009
Specifications are subject to change without notice.